Waste Management

Most spills occur in the process areas and consist of drips and leaks that fall directly on the concrete pad. Each of the process areas is equipped with a Stormwater and Spill Collection Sump (SWMU No. 14.2) that collects stormwater; portions of spills, during rainstorms, may be captured by stormwater and collected in the sumps. Once a spill occurs, KMCO personnel contain the spill with squeegees and try to keep the spills out of the sumps. Recoverable volumes of spills are collected by vacuum pumps and re-processed (Manning Engineering, 1988). Residues from recovered spills and smaller spills can be managed in two ways, depending on the location of the spill. For small spills and residues in areas which drain poorly or areas where spills may migrate, absorbent materials can be used to clean the spills. Absorbent pads and pellets are placed directly on the spills. They absorb the spill and are then discarded in the Bulk Storage Area for Diatomaceous Earth (SWMU No. 1). Small spills and residues in well-drained areas or within areas where spill migration is unlikely are often left alone to slowly migrate towards the sumps and evaporate. Precipitation can contact these spills, resulting in large volumes of what may be contaminated stormwater entering the sumps. Precipitation may also be contaminated when it rinses down the outside of stained tanks and other units. The contaminated stormwater is collected in the sumps and treated on-site at KMCO's Wastewater Treatment Plant (SWMU No. 15). Tanks are rinsed monthly with steam hoses and any wastewater generated is also treated. On some occasions, large volumes of un-diluted spilled liquids have entered the sumps. These spills were pumped back into feed tanks and re-processed or treated on-site.

The case is similar for stormwater from the concrete pad underlying the remaining sections of the facility. Spills occasionally occur from loading and unloading operations, although buckets are placed underneath the trucks to minimize spillage. Most spills outside of the process areas are cleaned up with absorbent materials. Precipitation can contact residue from these spills and may become contaminated. The stormwater is directed to several Stormwater and Spill Collection Sumps (SWMU No. 14.2) located in low points of the facility. From these sumps, it is pumped to the Wastewater Treatment Plant (SWMU No. 15). The stormwater from the pad underlying the Wastewater Treatment Plant flows into the Stormwater Collection Ditch (SWMU No. 14.3) or into a Stormwater and Spill Collection Sump and enters the Wastewater Treatment Plant for on-site treatment.

Before the Wastewater Treatment Plant (SWMU No. 15) was built in 1984, the stormwater from the process areas (i.e., inside the concrete berms) was collected in storage tanks and disposed of off-site at EMPAK's deep injection well. The major spills were managed in the same manner as they are today (i.e., recovered with vacuum pumps). Stormwater from the cement pad outside of the process areas was not collected or treated.

Environmental Releases

It is unknown whether there have been any waste releases from the Facility Wide Concrete Pad. There have been no reported releases from this unit. Moreover, the extent of any contaminants passing through the concrete pad and entering the subsoil and ground water is also unknown. No information on the extent of contamination underneath the pad is available, such as ground-water monitoring data or soil samples. Cracks were found in several locations on the concrete pad, but KMCO has stated that it regularly repairs substantially worn segments of the pad. Cracks may provide a pathway for stormwater to seep into the soil.

Remedial Action Taken

No remedial action, beyond general maintenance, has been taken.

Suggested Action

ICF recommends a RCRA Facility Investigation (RFI) consisting of a full visual inspection of the Facility Wide Concrete Pad. All cracks should be visually inspected for severity (i.e., width and depth). If cracks are significantly enlarged (e.g., large enough to allow seepage into the pad), soil borings should be made at these points to collect soil samples for analysis.

Reasons

The Facility Wide Concrete Pad is subjected to an almost constant exposure to varying degrees of contamination. The pad was in fair condition at the time of the VSI, but there were numerous cracks and other signs of wear. Despite KMCO's frequent inspection and repairs of the pad, ICF believes that seepage through existing cracks may be reaching soil underlying the pad. Given the potential for contaminants in this seepage, further inspection of the pad is warranted, and chemical analysis of underlying soils may be warranted.

4.14.2 SWMU NO. 14.2 - STORMWATER AND SPILL COLLECTION SUMPS (Photographs 16-18)

Description

There are approximately 25 Stormwater and Spill Collection Sumps located about the facility. Each of KMCO's 10 tank farms and process areas are equipped with at least one sump (15 sumps in 10 process areas). In addition, there are another 10 sumps located at low points about the facility. There is also one sump in the Wastewater Treatment Plant (SWMU No. 15). The sumps consist of a round hole in the ground that is five feet in diameter. The sumps are two feet deep and are covered with a steel grate. There is a raised square berm (six foot sides) surrounding each sump. A positive displacement pump is mounted above each sump. The pumps are manually operated. The insides of the sumps could not be inspected during the January 30, 1992 VSI because each sump visited was filled with liquids. KMCO, however, inspects the sumps every two or three months for cracks; to date, no major repairs have been necessary (KMCO, Inc., 1992b).

Status

The Stormwater and Spill Collection Sumps have been operation since the 1975 when the facility opened. As the facility has expanded, more sumps have been added in the new process areas and in the Wastewater Treatment Plant (SWMU No. 15). The sumps are neither RCRA-permitted nor RCRA-regulated.

Waste Type

The wastes managed by the Stormwater and Spill Collection Sumps consist of both process spills and stormwater. Stormwater can be contaminated by feed, product, and waste streams. Contaminants may include glycols, glycol ethers, amines, petroleum products, and others. The stormwater and spills in the sumps at the process areas have the highest concentration of contaminants due to the high frequency of routine process spills. The stormwater in sumps from

the remaining sections of the facility will have lower concentrations of contaminants because few spills occur outside of the process areas.

Waste Management

The sumps collect the contaminated stormwater and process spills. Major spills are often recovered with vacuum pumps. Large volumes of spilled liquids that do enter the sumps can be pumped back into feed tanks for subsequent re-processing. Other wastes that accumulate in the sumps, such as stormwater or small volumes of spilled liquids, are directed to the Wastewater Treatment Plant (SWMU No. 15) by one of two methods. The water in the sumps can be pumped into a Stormwater Collection Ditch (SWMU No. 14.3) that is located along the western border of the facility. This ditch leads to three pumps that pump the water into the Equalization Tank (SWMU No. 15.3). In the past few years, KMCO has begun to install piping so that the water in the sumps can be pumped directly to the Equalization Tank. This new system by-passes the Stormwater Collection Ditch and allows KMCO more control over the system. All of these operations are the responsibility of the manager of the Wastewater Treatment Plant. In times of rain, this employee must monitor the levels of the sumps and Stormwater Collection Ditch. Since the sumps are not equipped with float activated switches, these must be closely watched. However, according to Mr. Maguire, there is an employee at the facility in charge of the Wastewater Treatment Plant and Stormwater and Spill Collection System at all times (24 hours a day).

When the facility first opened, the Wastewater Treatment Plant (SWMU No. 15) did not exist. At that time, stormwater from outside the process areas was not treated. Stormwater and smaller spills from the process areas were pumped into waste storage tanks and stored until disposed of off-site at EMPAK's deep injection well. The major spills were managed in the current manner.

Environmental Releases

It is unknown whether there have been any waste releases from the Stormwater and Spill Collection Sumps. There have been no reported releases from this SWMU. Moreover, the extent of any contaminants passing through the concrete walls of the sumps and entering the subsoil and ground-water table is also unknown. No information on the extent of contamination underneath the sumps is available such as ground-water monitoring data or soil samples. In addition, it was impossible to determine the integrity of the sumps during the January 30, 1992 VSI because they were filled with liquid; however, KMCO has stated that it regularly inspects the sumps (KMCO, 1992b).

Remedial Action Taken

No remedial action has been taken beyond KMCO's regular inspections.

Suggested Action

ICF recommends that KMCO submit written documentation of the dates and results of integrity tests for all sumps to verify the tests. If KMCO cannot provide documentation, ICF recommends that a RFI be performed to test the integrity of all sumps.

Reasons

The Stormwater and Spill Collection Sumps are subjected to an almost constant exposure to varying degrees of contamination. It was impossible to determine the integrity of the sumps, during the January 30, 1992 VSI, because they were filled with liquid and were below grade. KMCO performs integrity tests for each sumps every two to three months; to date, no major repairs have been necessary (KMCO, Inc., 1992c). However, KMCO did not provide documentation of these tests. ICF believes that written documentation to verify the integrity of the sumps should be provided.

4.14.3 SWMU NO. 14.3 - STORMWATER COLLECTION DITCH (Photographs 19 and 20)

Description

The Stormwater Collection Ditch is a concrete-lined canal that extends approximately 300 feet along the western border of the facility and conveys stormwater run-off south to the Wastewater Treatment Plant (SWMU No. 15). It is approximately six feet wide and four feet deep. The area adjacent to the ditch showed no signs of an overflow. The Facility Wide Concrete Pad abuts the east side of the ditch. The west side of the ditch abuts a gravel railroad bed. The ditch was in good condition, although there were some visible cracks. The bottom of the ditch could not be seen at the time of the January 30, 1992 VSI because there was approximately two feet of slowly flowing water in the ditch. There was no secondary containment along the ditch. Mr. Maguire stated that a third pump was added that drains the ditch, and that the pump could empty it in just a few minutes.

Status

The Stormwater Collection Ditch was installed in 1986 and is currently active. In 1988, the ditch was widened and relined with concrete. The ditch is not RCRA-regulated.

Waste Type

The wastes managed by the Stormwater Collection Ditch consists entirely of stormwater. Stormwater can become contaminated from contact with spills of any of KMCO's feed, product, or waste streams. The stormwater carried in the ditch may have traces of glycols, glycol ethers, amines, petroleum products, and other organic residues.

Waste Management

Contaminated stormwater is collected in the Stormwater and Spill Collection Sumps (SWMU No. 14.2) and then pumped into the Stormwater Collection Ditch. Water also enters the ditch as sheet runoff from the concrete pad. The water flows down the ditch, which leads south to the inlet of the Wastewater Treatment Plant (SWMU No. 15). The ditch ends at the inlet of three pumps that pump the stormwater into the Equalization Tank (SWMU No. 15.3).

In the past few years, KMCO has begun to incorporate a second method of directing the stormwater into the Wastewater Treatment Plant (SWMU No. 15). KMCO has begun to install piping so that the water in the sumps can be pumped directly to the Equalization Tank (SWMU No. 15.3). This new system by-passes the Stormwater Collection Ditch and allows KMCO more control over the system.

Environmental Releases

There have been no reported releases from this SWMU. There is no information available on the extent of contamination underneath the ditch such as ground-water monitoring data or soil samples. It was impossible to determine the integrity and permeability of the ditch during the January 30, 1992 VSI.

Remedial Action Taken

No remedial actions have been taken.

Suggested Action

ICF recommends a RFI be performed to determine whether this unit has contaminated the subsurface.

Reasons

The Stormwater Collection Ditch is subjected to fairly constant exposure to contamination. If the ditch were to overflow, it might contaminate soils on the western side of the ditch. The ditch was in good condition at the time of the VSI, but it showed some signs of cracking. However, it was impossible to determine the integrity of the ditch during the January 30, 1992 VSI because it contained water. The ditch was relined with concrete in 1988 after operating for two years.

4.15 SWMU NO. 15 - WASTEWATER TREATMENT PLANT (Photograph 21)

Description

The Wastewater Treatment Plant consists of nine units operating to treat the wastewater generated at the KMCO facility. The Wastewater Treatment Plant is located in the southwestern corner of the facility, approximately 400 feet south-southwest of the central shop area. The Wastewater Treatment Plant consists of the following nine components.

(1) Adjusting Tanks (2)
(2) Anaerobic Digester
(3) Equalization Tank
(4) Aeration Tank
(5) Clarifier
(6) Sand Filter
(7) Charcoal Filters (3)
(8) Chlorine Contact Chamber
(9) Surge Tank

All of the tanks are constructed of carbon-steel. All open top tanks are equipped with a high level alarm to prevent overflow. All of the components of the treatment plant were in good condition at the time of the January 30, 1992 VSI with traces of surface rust on a few tanks. No signs of accidental waste releases were observed during the VSI. Each of these components will be examined as individual SWMUs (SWMUs 15.1 - 15.9) in the following sections.

All of the components of the Wastewater Treatment Plant are located on a slab of concrete. The concrete slab is cracked in places and shows signs of wear. The pad has been repaired in a few places. The pad slopes to the northwest, or towards the facility and towards a Stormwater and Spill Collection Sump (SWMU No. 14.2) and the Stormwater Collection Ditch (SWMU No. 14.3). The concrete slab and Wastewater Treatment Plant is surrounded by berms on all four sides. The berms on the north and eastward sides as well as part of the westward side are constructed of three feet high concrete walls. The berm to the south (forming the border of the plant that parallels the Parker Crosby Highway) and the remaining portion of the westward berm consist of a five-foot high, earthen plastic- and clay-lined dike. The containment area is sloped so that spills flow toward the facility and can be redirected back into the front end of the waste treatment plant. The sloped concrete pad also minimizes water infiltrating through the earthen berms.

The Wastewater Treatment Plant began operating in 1985. It was active at the time of the January 30, 1992 VSI. The entire Wastewater Treatment Plant is permitted by the Texas Water Commission under Permit Number 02712. The following outfall limitations and sampling conditions apply.

TABLE 4-1 - NPDES PERMIT CONDITIONS

Effluent Characteristic	Daily Avg. (lbs/day)	Daily Max (lbs/day)	Single Grab (mg/L)	Measurement Frequency
Flow (MGD)	.056 MGD	.070 MGD	N/A	1 per day
BOD (5 day)	11.4	22.8	75	2 per week
Total Suspended Solids	13.7	27.5	90	2 per week
COD	73.4	147.0	480	2 per week
Ammonia as N	4.2	8.4	30	2 per week
Oil and Grease	4.6	9.3	20	2 per week
Phenols	0.05	0.09	0.3	2 per week
Zinc (mg/l)	Report	Report	N/A	1 per week
Xylene	N/A	N/A	1.0	1 per month
Total Phosphorous	N/A	N/A	20.0	N/A

The wastes treated include wastes from three waste streams generated on-site at KMCO: (1) low-strength wastewater generated in the process areas (approximately 5,000 gallons per day), (2) stormwater runoff collected in the Stormwater and Spill Collection System (SWMU No. 14) (approximately 46,000 gallons per day), and (3) facility sanitary wastewater (approximately 3,000 gallons per day) (KMCO, Inc., 1990). Low-strength wastewater is primarily washwater from cleaning process equipment contaminated with organic residues, but this wastewater can also include some lower concentration cuts from distillation runs, water used for purification in reaction processes, and small quantities of high-COD waste laboratory chemicals. Residues may contain glycols, glycol ethers, amines, petroleum products, and others organic contaminants. The COD of this water can exceed 50,000 mg/L but should be less than 100,000 mg/L. High-strength wastewater has COD concentrations exceeding 100,000 mg/L and is disposed of off-site.

Stormwater runoff collected in the stormwater collection system (SWMU No. 14) makes up the bulk of the water treated. It is contaminated with low concentrations of organics from contact with minor processing spills throughout the facility. Contaminants include low levels of glycols, glycol ethers, amines, petroleum products, and virtually any other chemical handled by KMCO.

The third waste stream, facility sanitary wastewater, is outside the scope of this report.

The stormwater runoff collected in the Stormwater and Spill Collection System (SWMU No. 14) is directed to the Wastewater Treatment Plant by one of two methods. The water in the Stormwater and Spill Collection Sumps (SWMU No. 14.2) can be pumped into the Stormwater Collection Ditch (SWMU No. 14.3) that is located along the western border of the facility. This ditch leads to three pumps that pump the water into the Equalization Tank (SWMU No. 15.3). In the past few years, KMCO has begun to install piping so that the water in the sumps can be pumped directly to the Equalization Tank. This new system by-passes the Stormwater Collection Ditch and allows KMCO more control over the system. The wastewater is stored in the waste storage tanks (SWMUs 2 through 12) for less than ten days before being pumped to the adjustment tanks from the process area. The wastewater is held so that the volume and COD levels of the Wastewater Treatment Plant feed stream is consistent over time. Facility sanitary wastewater is collected in holding tanks (separate from the process wastewater tanks) and piped to the Aeration Tank (SWMU No. 15.4) of the Wastewater Treatment Plant. KMCO disposes of small quantities of waste chemicals used in its on-site laboratories along with its sanitary wastewater.

When the volume of wastewater (including stormwater) needing treatment exceeds the capacity of the Wastewater Treatment Plant, KMCO can dispose of the excess in the EMPAK injection well. During the VSI, KMCO indicated that it has disposed of excess wastewater in this manner on several occasions.

The low-strength wastewater is fed into the Adjusting Tanks (SWMU No. 15.1) where the pH is neutralized and nutrients added. This water is then biodegraded in the Anaerobic Digester (SWMU No. 15.2) to lower the COD level. This effluent is then mixed with the stormwater runoff in the Equalization Tank (SWMU No. 15.3). The Equalization Tank homogenizes the waste and serves as a surge tank to maintain a constant flow rate out of the Equalization Tank. The effluent from the Equalization Tank is pumped into the Aeration Tank (SWMU No. 15.4) where it is oxygenated and aerobically biodegraded. From the Aeration Tank, the wastes flow to the Clarifier (SWMU No. 15.5) where the solids settle out. The Clarifier effluent flows to either the Sand Filters (SWMU No. 15.6) or the Charcoal Filters (SWMU No. 15.7) where the remaining contaminants are filtered out. Finally, the wastewater is disinfected in the Chlorine Contact Chamber (SWMU No. 15.8) before being discharged to an unnamed ditch that flows to the Jackson Bayou and then to the San Jacinto River. On some occasions, effluent from the Clarifier can be fed directly into the Chlorine Contact Chamber. Much of the effluent from the treatment plant is reused at the KMCO facility as utility water. At the time of the January 30, 1992 VSI, even though the Wastewater Treatment Plant was running, there was no outfall. Any recycled water is taken directly out of the Chlorine Contact Chamber.

During the January 30, 1992 VSI, there were no observations that indicated that there had been any environmental releases originating from the Wastewater Treatment Plant. In addition, the Preliminary Document Review (PR) disclosed no violations of the NPDES permit due to environmental releases or any records of remedial actions taken. The plant was in good condition and all elements seemed to be functioning properly.

4.15.1 SWMU NO. 15.1 - ADJUSTING TANKS (2) (Photograph 22)

Description

The Adjusting Tanks are two identical, above-ground steel tanks, constructed of two-inch steel. They are both open-topped and each hold 20,000 gallons. The Adjusting Tanks are not located on a pedestal but sit directly on the concrete slab that constitutes the surface of the Wastewater Treatment Plant. The Adjusting Tanks are located near the midpoint of the northern dike of the Wastewater Treatment Plant. The tanks both have high level alarms to prevent overflow. In addition, the Adjusting Tanks are surrounded by berms as discussed in Section 4.16. Both are on good condition with some surface rust but no signs of waste releases.

The purpose of the Adjusting Tanks is to pretreat any wastes with extreme levels of pH or wastes lacking nutrients. Any wastes that need pretreatment are pumped directly to the tanks where the pH can be adjusted or nutrients added before the wastes are pumped to the Anaerobic Digester (SWMU No. 15.2). Caustic or acid is added as required to neutralize the pH, and urea is batch-added to provide nutrients for the digester. The pretreatment prevents disruption of the digester and provides necessary nutrients for economical biodegradation of the biomass.

Status

The Adjusting Tanks began operation in 1985 when the Wastewater Treatment Plant was built. They were operational at the time of the VSI. The Adjusting Tanks are registered as part of the Wastewater Treatment Plant, which is registered and permitted by the Texas Water Commission under Permit Number 02712. The tanks are also regulated under TACB Permit R-9383. The tanks are exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

The wastes treated in the Adjusting Tanks consist largely of low-strength wastewater, to be distinguished from the high-strength wastewater that is disposed of off-site at EMPAK's deep injection well. The wastewater is primarily washwater from cleaning process equipment contaminated with organic residues, but this wastewater can also include some lower concentration cuts from distillation runs and water used for purification in reaction processes. Residues may contain glycols, glycol ethers, amines, petroleum products, and others organic contaminants. The COD of this water is typically less than 100,000 mg/L.

Waste Management

The low-strength wastewater is collected in any of the eleven waste storage tanks (SWMUs 2 through 12), depending upon KMCO's operating conditions. The wastewater is stored in these tanks for less than ten days before being pumped to the Adjusting Tanks from the process area. The wastewater is held so that the volume and COD levels of the Wastewater Treatment Plant feed stream is consistent over time.

Environmental Releases

There have been no documented environmental releases from the Adjusting Tanks.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Adjusting Tanks are well maintained and constructed of two-inch steel walls to withstand any corrosive effects of the wastewater. Some minor surface rust is visible. Three forms of secondary containment, a high level alarm, daily measurement of the tank level, and a berm around the Wastewater Treatment Plant prevent environmental releases. In addition, no signs of waste releases were observed during the January 30, 1992 VSI.

4.15.2 SWMU NO. 15.2 - ANAEROBIC DIGESTER (Photograph 23)

Description

The Anaerobic Digester is a closed 21,000-gallon tank. The tank has a diameter of 12 feet and is 28 feet tall. It is constructed of two-inch carbon-steel and covered with a shiny aluminum outer shell. The tank sits directly on the concrete surface of the Wastewater Treatment Plant. It is located about five feet to the south of the Adjusting Tanks (SWMU No. 15.1). The tank does not have a high level alarm. The digester seemed to be in good condition except for signs of surface rust along the bottom portion of the tank.

The Anaerobic Digester is designed to efficiently biodegrade the organic chemical contaminants. It consists of a packed bed vessel to provide surface contact between the influent and the biomass culture. The throughput of the digester ranges from one to eight gallons per minute.

Status

The Anaerobic Digester began operation in 1985 when the Wastewater Treatment Plant was built. The digester was operational at the time of the VSI. The digester is registered as part of the Wastewater Treatment Plant, which is permitted by the Texas Water Commission under Permit Number 02712. The tank is also regulated under TACB Permit R-9383. The digester is exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

The waste treated in the Anaerobic Digester is the effluent from the Adjusting Tanks (SWMU No. 15.1). The Adjusting Tanks effluent consists of washwater from cleaning process equipment to which urea, caustic, or acid has been added. Urea is added to increase the nutrient level and caustic or acid is added to neutralize the pH. Wastewater residues may contain glycols, glycol ethers, amines, petroleum products, and other organic contaminants. The COD of this water is less than 100,000 mg/L.

Waste Management

The wastewater effluent from the Adjusting Tanks (SWMU No. 15.1) is pumped directly into the Anaerobic Digester. The wastewater is retained for up to twelve days to break down 70% of the organic contaminants. The effluent from the digester is then pumped into the Equalization Tank (SWMU No. 15.3) for further treatment.

Environmental Releases

There have been no documented environmental releases from the Anaerobic Digester.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Anaerobic Digester is well maintained and constructed of two-inch steel walls to withstand any corrosive effects of the wastewater. Secondary containment, provided by the berm around the Wastewater Treatment Plant and a high level alarm, prevents environmental releases. Some rust is visible along the bottom of the tank, but it does not appear to be caused by tank leakage. There were no other signs of waste releases observed during the January 30, 1992 VSI.

4.15.3 SWMU NO. 15.3 - EQUALIZATION TANK (Photographs 24 and 25)

Description

The Equalization Tank is a 1,000,000-gallon open tank. It has a diameter of 73 feet and is 32 feet tall. It is constructed of coated and treated two-inch steel. The tank sits directly on the concrete surface of the Wastewater Treatment Plant and is located approximately ten feet to the southeast of the Adjusting Tanks (SWMU No. 15.1). To prevent overflow, it has a high level alarm. In addition, the Equalization Tank is situated within the bermed in area that surrounds the Wastewater Treatment Plant. The Equalization Tank is equipped with a floating aerator to provide partial treatment and to prevent odors caused by a anaerobic conditions. In addition, there is a method for removing settled solid from the tank. There were no signs of rust on the Equalization Tank and it was in very good condition. At the time of the January 30, 1992 VSI, there were no signs of waste releases.

The Equalization Tank mixes the wastes before they are biologically treated in the Aeration Tank (SWMU No. 15.4). The Equalization Tank dampens out sudden variations of influent and allows the wastes to gain equal concentration, temperature, and pH before biological treatment so to avoid the detrimental effects of shock to the microorganisms. The Equalization Tank also serves as a reservoir to hold wastewater. In times of heavy rains, the Equalization Tank can retain the stormwater runoff for subsequent treatment. It is designed to hold a surge capacity of one month of peak rainwater flows.

Status

The Equalization Tank began operation in 1985 when the Wastewater Treatment Plant was built. The tank was operational and in use at the time of the VSI. The Equalization Tank is registered as part of the Wastewater Treatment Plant, which is permitted by the Texas Water Commission under Permit Number 02712. The tank is also regulated under TACB Permit R-9383. The tank is exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

The wastes treated in the Equalization Tank come from two sources. The effluent of the Anaerobic Digester (SWMU No. 15.2) is pumped into the Equalization Tank where it is mixed with the other waste stream. This feed has already had 70 percent of its organic contaminants biodegraded (KMCO, Inc., 1984). The other major waste stream is stormwater runoff collected in the Stormwater and Spill Collection System (SWMU No. 14). This stream makes up the bulk of the water treated. It is contaminated with low concentrations of organics from contact with minor processing spills throughout the facility. Contaminants include low levels of glycols, glycol ethers, amines, petroleum products, and virtually any other chemical handled by KMCO.

Waste Management

The waste stream from the Anaerobic Digester (SWMU No. 15.2) is pumped directly into the Equalization Tank from the nearby digester. The stormwater runoff is collected via the Stormwater and Spill Collection Sumps (SWMU No. 14.2) about the facility. These sumps in the past have pumped the water into a Stormwater Collection Ditch (SWMU No. 14.3) that borders the west side of the facility. This practice may lead to the overflow of the Stormwater Collection Ditch. Recently, however, KMCO has added pipelines that allow the sumps to pump the stormwater runoff directly into the Equalization Tank. This practice by-passes the Stormwater Collection Ditch and minimizes the potential for environmental releases.

Environmental Releases

There have been no documented releases from the Equalization Tank.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Equalization Tank is well maintained and constructed of two-inch steel walls to withstand any corrosive effects of the wastewater. Secondary containment, provided by a high level alarm and a berm around the Wastewater Treatment Plant, prevents environmental releases. The tank was in very good condition and there were no other signs of waste releases observed during the January 30, 1992 VSI.

4.15.4 SWMU NO. 15.4 - AERATION TANK (Photograph 26)

Description

The Aeration Tank is a 1,000,000-gallon tank that is of similar construction as the Equalization Tank (SWMU No. 15.3). It has a diameter of 65 feet and is 32 feet tall. The Aeration Tank is constructed of two-inch thick lined carbon-steel and has an open top. The tank sits directly on the concrete surface of the Wastewater Treatment Plant and is located 30 feet south of the Adjusting Tanks (SWMU No. 15.1). The Aeration Tank has a high level alarm to prevent overflow and is located within the berms that surround the Wastewater Treatment Plant. The tank is in very good condition with no signs of rust or waste releases.

The Aeration Tank accepts a constant flow of wastewater from the Equalization Tank (SWMU No. 15.3). The Aeration Tank introduces oxygen to the wastewater which causes the aerobic biodegradation of the organic contaminants. It is designed with a residence time of fourteen days to allow for the biodegradation of the influent's known constituents. The oxygen is supplied by submerged stationary vertical aerators. According to Mr. Maguire, no solid sludge has had to be disposed from the Aeration Tank.

Status

The Aeration Tank began operation in 1985 when the Wastewater Treatment Plant was built. The tank was operational and in use at the time of the VSI. The Aeration Tank is registered as part of the Wastewater Treatment Plant, which is permitted by the Texas Water Commission under Permit Number 02712. The tank is also regulated under TACB Permit R-9383. The tank is exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

The Aeration Tank treats the effluent of the Equalization Tank. This effluent consists primarily of stormwater runoff and process vessel washwater although it contains smaller amounts of wastewater from other process steps (see SWMU 15.1). Contaminants in the wastewater will include low levels of glycols, glycol ethers, amines, and petroleum products and an elevated COD level.

Waste Management

The effluent from the Equalization Tank (SWMU No. 15.3) is pumped directly into the Aeration Tank. The effluent then flows to the Clarifier (SWMU No. 15.5) and eventually into the Chlorine Contact Chamber (SWMU No. 15.8). If the COD levels are still elevated, the aeration effluent can be recycled back into the Equalization Tank for a second round of treatment.

Environmental Releases

There have been no documented releases from the Aeration Tank.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Aeration Tank is well maintained and constructed of two-inch lined steel walls to withstand any corrosive effects of the wastewater. Secondary containment, provided by a high level alarm and a berm around the Wastewater Treatment Plant prevent environmental releases. In addition, the tank was in very good condition and there were no other signs of waste releases observed during the January 30, 1992 VSI.

4.15.5 SWMU NO. 15.5 - CLARIFIER (Photograph 26)

Description

The Clarifier is a 36,000-gallon, open-topped tank constructed of two-inch thick lined steel. It has a diameter of approximately 14 feet and is 32 feet tall. The Clarifier is adjacent to the Aeration Tank (SWMU No. 15.4) and is located 50 feet south of the Adjusting Tanks (SWMU No. 15.1). The Clarifier sits directly on the concrete surface of the Wastewater Treatment Plant. It is equipped with a high level alarm to prevent overflow and is located within the berms that surround the Wastewater Treatment Plant. The tank is in good condition with no signs of rust or waste releases.

The Clarifier serves to remove the solids from the wastewater. It is designed to slow the flow of the water so that the solids settle out due to gravity. The treated wastewater from the Aeration Tank (SWMU No. 15.4) enters the Clarifier and flows across the tank at a very slow velocity, allowing the solids to settle to the bottom. The wastewater exits the tank by passing over a weir and then flows into either the Sand Filter (SWMU No. 15.6) or the Charcoal Filters (SWMU No. 15.7) or directly into the Chlorine Contact Chamber (SWMU No. 15.8).

Status

The Clarifier began operation in 1985 when the Wastewater Treatment Plant was built. The Clarifier was operational at the time of the VSI. The Clarifier is registered as part of the Wastewater Treatment Plant, which is permitted by the Texas Water Commission under Permit Number 02712. The Clarifier is exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

The Clarifier treats the effluent of the Aeration Tank (SWMU No. 15.4). The wastewater in the Clarifier consists of stormwater runoff and process vessel washwater that has been treated in the preceding units of the Wastewater Treatment Plant. There may be very low levels of contaminants remaining in the wastewater that may include glycols, glycol ethers, amines, and petroleum products. However, the COD level should be below 480 mg/L, the maximum permitted outfall COD level (TWC, 1991c).

Waste Management

Effluent from the Aeration Tank (SWMU No. 15.4) enters the Clarifier by gravity flow. The solids settle to the bottom of the Clarifier. The settled solids are then recycled back to the Aeration Tank to provide nutrients. According to Mr. Maguire, no solid sludge has had to be disposed of from the Clarifier, they are all recycled to the Aeration Tank. The clean effluent from the Clarifier then flows by gravity to either the Sand Filter (SWMU No. 15.6) or the Charcoal Filter (SWMU No. 15.7) or directly into the Chlorine Contact Chamber (SWMU No. 15.8).

Environmental Releases

There have been no documented releases from the Clarifier.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Clarifier appears to be well maintained and constructed of two-inch lined steel walls to withstand any corrosive effects of the wastewater. Secondary containment, provided by a high level alarm and a berm around the Wastewater Treatment Plant, prevents environmental releases. In addition, the Clarifier was in very good condition and there were no other signs of waste releases observed during the January 30, 1992 VSI.

4.15.6 SWMU NO. 15.6 - SAND FILTER (Photograph 26)

Description

The Sand Filter is a 100-gallon, two-inch thick carbon-steel, cylindrical tank filled with sand. The filter is located 60 feet south of the Adjusting Tanks (SWMU No. 15.1) in the southwestern corner of the Wastewater Treatment Plant. The filter sits directly on the concrete surface of the Wastewater Treatment Plant. It is located within the berms that surround the Wastewater Treatment Plant. The filter is in good condition with some surface rust but no signs of waste releases.

The Sand Filter receives treated wastes from the Clarifier (SWMU No. 15.5) and passes them through a sand matrix. The sand acts a filter, removing particulate matter such as suspended solids or suspended biomass that did not settle in the Clarifier.

Status

The Sand Filter was placed in operation in 1987. The filter was operational at the time of the VSI. The Sand Filter is registered as part of the Wastewater Treatment Plant, which is permitted by the Texas Water Commission under Permit Number 02712. The filter is exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

The Sand Filter treats the effluent from the Clarifier (SWMU No. 15.5). This wastewater consists of stormwater runoff and process vessel washwater that has been treated in the preceding units of the Wastewater Treatment Plant. There may be very low levels of contaminants remaining in the wastewater that may include glycols, glycol ethers, amines, and petroleum products. However, the COD level should be below 480 mg/L, the maximum permitted outfall COD level (TWC, 1991c).

Waste Management

The effluent from the Clarifier (SWMU No. 15.5) is pumped directly into the Sand Filter in times of heavy rain, to speed the treatment time and relieve the stress on the other elements of the Wastewater Treatment Plant. The effluent is pressurized and forced through the sand matrix to remove particulate matter. The wastewater is then pumped to the Chlorine Contact Chamber (SWMU No. 15.8) for disinfection before discharge. Over time, the pores of the sand matrix are filled with the filtered contaminants. To remove the contaminants, the system is backwashed. As of the VSI, no sand had been disposed of.

Environmental Releases

There have been no documented releases from the Sand Filter.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Sand Filter is well maintained and constructed with two-inch carbon-steel walls. Secondary containment provided by a berm around the Wastewater Treatment Plant prevents environmental releases. In addition, the filter was in good condition with only minor surface rust and there were no signs of waste releases observed during the January 30, 1992 VSI.

4.15.7 SWMU NO. 15.7 - CHARCOAL FILTERS (Photograph 26)

Description

The Charcoal Filters consist of three 100-gallon cylindrical tanks. Each vessel is filled with charcoal and constructed of two-inch thick carbon-steel. The filters are located 60 feet south of the Adjusting Tanks (SWMU No. 15.1) in the southwestern corner of the Wastewater Treatment Plant. They sit on steel legs that elevate the filters approximately three feet off the concrete. The filters are located within the berms that surround the Wastewater Treatment Plant. The filters are in good condition with some surface rust but no signs of waste releases.

The Charcoal Filters receive treated wastewater from the Clarifier (SWMU No. 15.5) and passes them through a bed of charcoal. The filters operate to remove any organic contaminants that were not biodegraded in the previous phases of the Wastewater Treatment Plant. The

charcoal absorbs many of the remaining organic contaminants and retains them bonded to the charcoal.

Status

The Charcoal Filters were installed in 1987. The filters were in service at the time of the VSI. The Charcoal Filters are registered as part of the Wastewater Treatment Plant, which is permitted by the Texas Water Commission under Permit Number 02712. The filters are exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

The Charcoal Filters treat the effluent from the Clarifier (SWMU No. 15.5). This wastewater consists of stormwater runoff and process vessel washwater that has been treated in the preceding units of the Wastewater Treatment Plant. There may be very low levels of contaminants remaining in the wastewater that may include glycols, glycol ethers, amines, and petroleum products. However, the COD level should be below 480 mg/L, the maximum permitted outfall COD level (TWC, 1991c).

Waste Management

The effluent from the Clarifier (SWMU No. 15.5) is pumped into the Charcoal Filters. The filters are in series, and the number in use depends on the loading of the Wastewater Treatment Plant. The effluent is pressurized and forced through the charcoal bed to remove the remaining organic contaminants. The wastewater is then pumped to the Chlorine Contact Chamber (SWMU No. 15.8) for disinfection before discharge.

Environmental Releases

There have been no documented releases from the Charcoal Filters.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Charcoal Filters are well maintained and constructed with two-inch carbon-steel walls. Secondary containment provided by a berm around the Wastewater Treatment Plant prevents environmental releases. In addition, the filter was in good condition with only minor surface rust and there were no signs of waste releases observed during the January 30, 1992 VSI.

4.15.8 SWMU NO. 15.8 - CHLORINE CONTACT CHAMBER (Photograph 26)

Description

The Chlorine Contact Chamber is a 200-gallon above-ground chamber. The chamber is a narrow cylinder with a diameter of three feet and is fifteen feet in height. The chamber is constructed of carbon-steel and is elevated three feet off the concrete surface on steel legs. The Chlorine Contact Chamber is located approximately 50 feet south of the Adjusting Tanks (SWMU No. 15.1) in the southwestern corner of the Wastewater Treatment Plant. The Chlorine Contact Chamber is located within the berms that surround the Wastewater Treatment Plant. At the time of the VSI, the chamber was in good condition with no signs of rust or waste releases.

The Chlorine Contact Chamber is designed to efficiently introduce chlorine into the treated wastewater. Wastewater enters the contact chamber from either the Sand Filters (SWMU No. 15.6) or Charcoal Filters (SWMU No. 15.7) or directly from the Clarifier (SWMU No. 15.5)

Status

The Chlorine Contact Chamber began operation in 1985 when the Wastewater Treatment Plant was built. The chamber was not in use at the time of the VSI but was operational. The Chlorine Contact Chamber is registered as part of the Wastewater Treatment Plant, which is permitted by the Texas Water Commission under Permit Number 02712. The chamber is also regulated under TACB Permit R-9383. The chamber is exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

The Chlorine Contact Chamber introduces chlorine to the effluents from the Sand Filter (SWMU No. 15.6), the Charcoal Filters (SWMU No. 15.7), and the Clarifier (SWMU No. 15.5). The wastewater in the Chlorine Contact Chamber consists of stormwater runoff and process vessel washwater that has been treated in the preceding units of the Wastewater Treatment Plant. There can be very low levels of contaminants remaining in the wastewater that may include glycols, amines, and petroleum products. However, the COD level should be below 650 mg/L, the maximum permitted outfall COD level.

Waste Management

The effluents from the Sand Filter (SWMU No. 15.6) and Charcoal Filters (SWMU No. 15.7) are pumped into the Chlorine Contact Chamber. The system is also designed to allow wastewater to enter the Chlorine Contact Chamber directly from the Clarifier (SWMU No. 15.5) in special cases. The contents of the chamber are then circulated through the chlorine injection loop and disinfected with chlorine. The disinfected effluent then falls into a sump and discharges through a fiberglass parshall flume to the point of outfall discharge.

Environmental Releases

There have been no documented releases from the Chlorine Contact Chamber.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Chlorine Contact Chamber is well maintained and constructed of carbon-steel walls to withstand any corrosive effects of the wastewater and chlorine. Secondary containment, provided by a berm around the Wastewater Treatment Plant and a high level alarm, prevents environmental releases. In addition, the tank was in good condition and there were no other signs of waste releases observed during the January 30, 1992 VSI.

4.15.9 SWMU NO. 15.9 - SURGE TANK (Photographs 26 and 27)

Description

The Surge Tank is an above ground, 20,000-gallon tank that is constructed of carbon-steel and has a closed top. It has a diameter of 12 feet and is 25 feet tall. The tank is located 60 feet southwest of the Adjusting Tanks (SWMU No. 15.1), abutting the western border of the Wastewater Treatment Plant. The Surge Tank sits directly on the concrete pad and is located within the berms that surround the Wastewater Treatment Plant. The tank is in good condition with no signs of rust or waste releases.

The Surge Tank was used to store treated water from the Aeration Tank (SWMU No. 15.4) for use in the plant as utility and fire water. According to Michael Maguire, the Surge Tank is no longer used and may be moved out of the Wastewater Treatment Plant in the future.

Status

The Surge Tank began operation in 1985 when the Wastewater Treatment Plant was built. The tank was not operational at the time of the VSI and there were plans to remove the tank from the Wastewater Treatment Plant. The Surge Tank has not been used to store water since 1991. The Surge Tank is still registered as part of the Wastewater Treatment Plant, which is permitted by the Texas Water Commission under Permit Number 02712. The tank is exempted from RCRA standards for hazardous waste TSDFs by 40 CFR 264.1(g)(6).

Waste Type

According to Michael Maguire, at the time of the January 30, 1992 VSI, the Surge Tank was empty. In the past, the Surge Tank held effluent (treated wastewater) from the Aeration Tank (SWMU No. 15.4).

Waste Management

The Surge Tank has not held wastes since mid-1991. The Surge Tank is intended to store treated water from the Aeration Tank (SWMU No. 15.4) for use in the plant as utility and fire water.

Environmental Releases

There have been no documented releases from the Surge Tank.

Remedial Action Taken

No remedial action has been taken.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

No wastes are held in the Surge Tank, and it has been inactive since mid-1991. If the Surge Tank were to be placed back in service, the suggested action would be the same because it is well maintained and constructed of two-inch carbon-steel walls to withstand any corrosive effects of the wastewater. Secondary containment provided by a berm around the Wastewater Treatment Plant prevents environmental releases. In addition, the tank was in good condition and there were no other signs of waste releases observed during the January 30, 1992 VSI.

4.16 SWMU NO. 16 - DRIP PANS (Photograph 28)

Description

This SWMU consists of approximately ten 20-gallon Drip Pans that are two feet wide by four feet long by one and one-half feet high and constructed of quarter-inch carbon-steel. The Drip Pans are positioned beneath pipe manifolds (see description below) and catch the routine spillage from pumping operations. There is one pipe manifold located at each tank farm. Drip Pans are a new addition to KMCO's waste management practices and are still being installed at some of the tank farms. The pans are located within the diked areas of each of the tank farms. At the time of the January 30, 1992 VSI, the Drip Pans were in good condition. There was some spillage around the Drip Pans, but the spillage enters the Stormwater and Spill Collection System (SWMU No. 14) and is treated at the on-site Wastewater Treatment Plant (SWMU No. 15).

Every storage tank at KMCO has an outlet pipe that leads to a central area in each tank farm. These pipes are fixed in a pipe rack and form the pipe manifold. Each pipe has a valve at the outlet and is capped. A hose can be affixed to the end of any one of these pipes. The hose runs to a Sandpiper diaphragm air pump. The pump outlet flows out of a second hose which can be affixed to the end of a second pipe at the pipe manifold. This allows the liquids to be transferred from tank to tank. The outlet hose can also be used to unload a tank by connecting the hose to a tanker truck. In addition, liquids can be pumped from tank farm to tank farm via a series of pipes running between the tank farms that also have outlets at the manifolds.

Status

The Drip Pans were first put in operation in 1990. KMCO is still installing them and plans to have a drip pan located at each of their pipe manifolds. At the time of the January 30, 1992 VSI, there were several Drip Pans installed and in use. The Drip Pans are not RCRA-regulated units.

Waste Type

The Drip Pans collect liquids that result from routine spillage during pumping operations. Spillage of any of KMCO's feed, product, and waste streams can occur due to leaks in pump seals or the pipe manifolds. These spills can include glycols, glycol ethers, petroleum streams, and others.

Waste Management

The Drip Pans collect liquids that result from routine spillage during pumping operations. Spillage occurs from bleeding the hoses and pipes and from drippage out of the end of the outlet pipes. Most of this spillage is pumped back into processing tanks and reprocessed. Contaminated pan contents are pumped to high-strength wastewater storage tanks and disposed of off-site in Empak's deep injection well.

Environmental Releases

There have been no major environmental releases from the Drip Pans. There may be some minor volatilization of wastes from the open Drip Pans.

Remedial Action Taken

There have been no remedial actions.

Suggested Action

ICF recommends no further action.

Reasons

The Drip Pans are well maintained and are constructed of carbon-steel to withstand any corrosive effects of the wastes. They are located within the bermed process areas, which provides secondary containment, and any spillage would be treated in the Wastewater Treatment Plant (SWMU No. 15). There were no signs of large spills from the Drip Pans observed during the January 30, 1992 VSI.

4.17 SWMU NO. 17 - SOLVENT SATELLITE COLLECTION DRUM (Photograph 29)

Description

The Solvent Satellite Collection Drum consists of a single, closed 55-gallon drum that is used to accumulate and store spent solvent before off-site disposal. The drum is located near Storage Tank T-007 (SWMU No. 8) and is 160 feet southeast of the central service area. The drum sits directly on the concrete surface of the plant and at the time of the January 30, 1992 VSI was not elevated on a pallet. The drum was not in a diked in area and was not covered by a roof. The drum was in good condition, and there were no signs of spillage around the drum.

Status

The Solvent Satellite Collection Drum was active at the time of the January 30, 1992 VSI. It is unknown how long this SWMU has been in operation. The satellite collection drum is not a RCRA-regulated unit.

Waste Type

The type of solvent in the drum is unknown. The drum was clearly marked used solvent but did not state the type of solvent. The solvent is used to clean pumps.

Waste Management

The used solvent is stored in a 55-gallon drum. The drum was closed and sealed but is stored outside. Mr. Maguire stated that the drum is picked up annually by Safety-Kleen.

Environmental Releases

There are no known environmental releases from the Solvent Satellite Collection Drum.

Remedial Action Taken

There have been no remedial actions.

Suggested Action

ICF recommends that the Solvent Satellite Collection Drum be stored inside the shop, protected from direct precipitation, and that the tank be stored on a pallet. Storage inside the shop will prevent rain water from striking the drum and rinsing solvent off the drum, contaminating stormwater. It will also move the drum to a location where it is less likely to be knocked over. Storing the drum on a pallet will protect the drum from corrosion.

Reasons

Although the drum was in very good condition and well maintained at the time of the January 30, 1992 VSI, the drum is stored outside (not under a roof). It is possible that rainwater falling on the drum may become contaminated with solvent and add to the volume of contaminated stormwater treated by the facility. In addition, the drum sits directly on the concrete and may corrode from fairly constant contact with water.

4.18 SWMU NO. 18 - ROLL-OFF BINS FOR MISCELLANEOUS SOLID WASTES (Photograph 30)

Description

SWMU 18 consists of two twenty-cubic yard roll-off bins. The bins are constructed of steel and are painted green. They are 15 feet long, 6 feet wide, and 6 feet deep. The bins are located near the product storage area, approximately 160 feet south of the central shop area. At the time of the January 30, 1992 VSI, the bins were uncovered and were not situated in a diked area. The bins appeared clean and well maintained, although there was some evidence of small spills and drips in the areas around the bins. ICF team members observed puddled green liquid below and extending from the base of one of the bins, suggesting a hole in the base of the bin; however, team member were unable to inspect the bottom of the bin and did not observe a hole in its base. According to Mr. Maguire, this liquid was anti-freeze dye, which he stated was a non-hazardous material.

Status

The roll-off bins were in use at the time of the VSI. It is unknown how long these bins have been in use. The bins are not RCRA-regulated units.

Waste Type

The wastes held in the two roll-off bins consist of packaging and other non-hazardous materials.

Waste Management

The wastes are placed in the roll-off bins by the employees. The bins are disposed of off-site by Mayfield.

Environmental Releases

There are no known environmental releases from the Roll-Off Bins for Miscellaneous Solid Wastes.

Remedial Action Taken

There have been no remedial actions.

Suggested Action

ICF recommends that KMCO cover the Roll-Off Bins for Miscellaneous Solid Wastes. A cover will minimize the amount of precipitation collecting and potentially leaching through the contents of the bins. ICF also recommends that KMCO inspect the bottom of the bin that appeared to be leaking the green liquid; if a hole is noted, ICF recommends that it be repaired.

Reasons

With the exception of the drainage beneath and extending from one of the bins, the bins appeared to be in good condition at the time of the January 30, 1992 VSI. The bins are, however, stored outside (not under a roof) and were uncovered at the time of the VSI, allowing rainwater to collect in the bins. Collected water could flow through the contents of the bin, possibly carrying chemical constituents with it. Furthermore, holes in the bottom of the bins could allow the liquid contents of the bins to flow onto the Facility Wide Concrete Pad (SWMU No. 14.1), eventually collecting in stormwater flowing across the pad and increasing the total loading of chemical constituents treated by the facility Wastewater Treatment Plant (SWMU No. 15).

4.19 SWMU NO. 19 - ROLL-OFF BIN FOR CRUSHED DRUMS (Photograph 31)

Description

SWMU 19 is a 20-cubic yard roll-off bin that is used to store crushed drums before they are disposed of off-site. The bin is constructed of steel and is covered with a metal top. The bin is approximately 20 feet long, 6 feet wide, and 5 feet high. The bin is located in the northwestern corner of the plant near the bag storage area, approximately 360 feet northwest of the central shop area. At the time of the January 30, 1992 VSI, the bin was in fair condition, although there was some surface rust. There was some evidence of small spills and drips on the concrete pad below the bin.

Status

The roll-off bin was in use at the time of the VSI. It is not registered on the TWC NOR. It is unknown how long this bin has been in use. The bin is not a RCRA-regulated unit.

Waste Type

The wastes held in the roll-off bin consists of crushed plastic and steel drums. The drums disposed of in this bin consist of drums that are damaged or can not be reused.

Waste Management

Each drum is rinsed and cleaned according to EPA guidelines for the chemical previously contained in the drum. Rinsate is sent to the Wastewater Treatment Plant (SWMU No. 15). The drums are then crushed and put into the covered roll-off bin. BFI picks up the bin and disposes of the drums at its Monroe, Louisiana landfill; its address is:

White Oaks Landfill
300 Meadowlark Drive
Monroe, Louisiana 71203

Environmental Releases

There are no known environmental releases from the Roll-Off Bin for Crushed Drums.

Remedial Action Taken

There have been no remedial actions.

Suggested Action

ICF recommends no further investigation of this SWMU.

Reasons

The Roll-Off Bin for Crushed Drums was in fair condition at the time of the January 30, 1992 VSI. The bin is covered with a steel top to minimize precipitation leaching through the drums. Finally, the drums in the bin are considered a non-hazardous waste and should not be contaminated.

4.20 SWMU NO. 20 - CONTAINER STORAGE AREA FOR ABSORBENT WASTES (no photograph)

Description

The Container Storage Area for Absorbent Wastes is a concrete area located in the northeastern corner of the facility. The container storage area is no longer used. The area abuts the northern border of the KMCO facility. The area was not visited during the January 30, 1992 Visual Site Inspection, but photographs taken during a TWC Solid Waste Inspection (TWC, 1989a) and in a report on a TWC Wastewater Treatment Plant Inspection (TWC, 1989d) that both occurred on July 31, 1989, indicate that there are no berms along this northern border of the concrete pad or surrounding the container storage area. The container storage area was used to hold drums, and later, dumpsters of absorbent wastes. According to the Solid Waste Inspection Report, the containers were kept in good condition and were inspected weekly.

Status

The Container Storage Area for Absorbent Wastes began operation when the facility opened in 1975. The area is no longer in use. KMCO personnel stated that KMCO stopped storing wastes in the container storage area in 1990. The absorbent wastes are now disposed of in the Bulk Storage Area for Diatomaceous Earth (SWMU No. 1). The Container Storage Area for Absorbent Wastes is, however, still listed as active on the TWC's Notice of Registration under the name "container storage area." The storage area is not a RCRA-regulated unit.

Waste Type

Wastes held on the container storage area consisted of 55-gallon drums of absorbent wastes. Absorbent wastes (Waste 4) consist of chemical absorbent pads or pellets used to clean up and absorb small spills. Absorbent wastes can be contaminated with any feed, product, or waste streams handled by KMCO including glycols, glycol ethers, amines, nickel catalysts, petroleum products, and other organics.

Waste Management

Absorbent wastes were collected from the filter presses in hoppers. The absorbent wastes were loaded into drums and stored at the container storage area. Dumpsters were also used to store the absorbent wastes. The absorbent wastes were picked up by Rollins Environmental Services for disposal at its Deer Park landfill; its address is:

2027 Battleground Road
Deer Park, Texas 77536

Environmental Releases

There was an environmental release from the container storage area in 1989. KMCO officials reported that the spill had occurred on July 1, 1989 when a heavy rain event caused something to overflow or overturn. KMCO did not report the spill. The Wastewater Treatment Plant Inspection reported that a greasy substance was observed, and that some of it may have flowed through a chain link fence and into the drainage ditch along the northern border of the facility. Photographs taken during TWC's inspection revealed dead vegetation in the area (TWC, 1989d). Incidentally, this spill occurred during the same storm that caused the Waste Oil Storage Tank to overflow (SWMU No. 13).

On July 15, 1987, TWC issued KMCO a notice of violation regarding the contents of 100 drums stored in the Container Storage Area For Absorbent Wastes that KMCO claimed held spent nickel catalyst (Waste 11) (TWC, 1987b). According to TWC, the drums in the container storage area were poorly labelled and may have contained miscellaneous waste blends as well as nickel catalyst. TWC inspectors suspected that the drums may have held glycol bottoms, but KMCO maintained that they contained only nickel catalyst (TWC, 1987b). None of these documents notes any releases from these drums. KMCO was ordered to run a hazardous waste determination on each of the drums (TWC, 1987b). TWC reinspected the facility on October 15, 1987 and found that KMCO had not run hazardous waste determinations on the 100 drums stored in the container storage area (TWC, 1987d). A second notice of violation was sent to KMCO on July 29, 1988 noting that fact (TWC, 1988).

Remedial Action Taken

KMCO removed the soil in the drainage ditch contaminated by runoff from the spill that occurred on July 1, 1989. A lab study confirmed that the spilled substance was oil. The soil was disposed of off-site.

KMCO responded to the notices of violation regarding the 100 drums in September 1988 and corrected the violations by testing the contents of the drums, disposing of the drums and their contents, and registering spent nickel catalysts as a waste produced (KMCO, Inc., 1988; TWC, 1989a). KMCO stated during the VSI that the matter had been resolved.

Suggested Action

ICF recommends no further investigation of the Container Storage Area for Absorbent Wastes except that the TWC Hazardous and Solid Waste Division should be officially notified that the SWMU is inactive and this fact properly documented.

Reasons

The Container Storage Area for Absorbent Wastes is no longer utilized by KMCO. KMCO should contact the TWC and have this fact properly documented on its Notice of Registration. The container storage area does not have a history of frequent releases, and KMCO removed contaminated soil from the one reported spill that occurred. There were no documented releases from the 100 drums of spent nickel catalyst; TWC was concerned about the contents of the drums, which have been removed.

4.21 SWMU NO. 21 - INACTIVE SURFACE IMPOUNDMENT (no photograph)

Description

The Inactive Surface Impoundment is presently covered by the 700-series tank farm (and the Facility Wide Concrete Pad, SWMU No. 14.1) in the northwest corner of the KMCO facility. The impoundment, an unlined earthen basin, was used prior to 1985 to store, treat, and recirculate contaminated cooling water (TDWR, 1984). The size of the impoundment is unknown but is estimated (by the VSI team) to be less than the surface area of the 700-series tank farm, which is approximately 13,000 square feet. The former depth of the impoundment is unknown. KMCO did not indicate how long the surface impoundment was in use prior to 1985; because the facility opened in 1975, it can be assumed that the impoundment was used for about ten years. KMCO stated during the VSI that it discontinued use of the impoundment in 1985 when it installed cooling towers.

Status

The Inactive Surface Impoundment is currently inactive and is covered by the Facility Wide Concrete Pad (SWMU No. 14.1) and the 700-series tank farm. The regulatory status of this unit is uncertain. The unit may be regulated under 40 CFR Part 264, Subpart K - Surface Impoundments.

Waste Type

The surface impoundment formerly contained contact cooling water with COD concentrations of about 9,000 mg/L (TWC, 1987a, 1987b). The former retention time of this water in the impoundment is unknown.

Waste Management

Contact cooling waters were discharged into the impoundment, treated with unknown materials, and allowed to cool before recirculating to the process area.

Environmental Releases

During an inspection in 1984, the Texas Department of Water Resources (TDWR, the predecessor to the TWC) noted "evidence of discharges off site without a permit as prohibited by TAC [Texas Administrative Code] 335.4." After its inspection, TDWR requested a response from KMCO indicating its plans and schedule for remedying the discharges.

No other documentation was made available to ICF regarding this evidence, the incident that created it, or KMCO's response to TDWR's request.

Remedial Action Taken

During the VSI, KMCO stated that after discontinuing use of the impoundment, KMCO pumped out the contents of the impoundment and filled it with "local material." KMCO did not indicate that any of the soils lying at the bottom of the unlined impoundment were removed. KMCO did not indicate how the contents of the impoundment were disposed; it is possible that they were treated in the Wastewater Treatment Plant (installed in 1985) (SWMU No. 15). KMCO subsequently covered the backfilled impoundment with the concrete pad and constructed the 700-series tank farm.

Mr. Maguire said during the VSI that he had no documentation of the remediation of the impoundment.

TWC requested in a letter to KMCO in 1987 the following (TWC, 1987b):

(1) A drawn to scale map of the site indicating all waste management units, both inactive and currently active.

(2) The dimensions and years in use of the cooling water recirculation pond, including details of additives for corrosion inhibition.

(3) A description of the process employed for treating contaminated cooling water and the source of contamination, and the steps taken to ensure complete decontamination.

The PR conducted in November 1991 for this RFA failed to identify a response to KMCO for this request; furthermore, the PR identified no documentation describing the remedial actions taken for the surface impoundment.

Suggested Action

ICF recommends a RFI consisting of soil borings at several locations in the 700-series tank farm to sample and analyze soils underlying the concrete pad. Soil boring locations and depths should be determined in consultation with KMCO, any documentation describing the remedial activity that may have gone uncovered during the PR, and any available construction plans for the 700-series tank farm, which may indicate former dimensions and exact location of the impoundment.

Reasons

Because there is no documentation of the remedial activities at the Inactive Surface Impoundment, no evidence exists that the impoundment was remediated in a manner approved by the TWC or U.S. EPA. Therefore, the impoundment is assumed to not be formerly "closed" under RCRA. Furthermore, because the impoundment was earthen and unlined, seepage to subsurface soils and to ground water of cooling waters stored in the impoundment while it was active may have occurred.

4.22 SWMU NO. 22 - INACTIVE WASTE PILE IN THE SALVAGE YARD (no photograph)

Description

The Inactive Waste Pile in the Salvage Yard consists of a former storage area to the east of Ramsey Road across from KMCO's main office on which 55-gallon drums of succinic acid still-bottoms were stored, uncovered and sitting on bare soil, for a five-year period from about 1982 to 1987; some of these drums had leaked, causing contamination of the ground surface (TWC, 1987c). Estimates of the number of drums stored during that period vary widely: TWC's estimates range from approximately 100 to 800 drums (1987a, 1987c), while KMCO stated during the January 30, 1992 VSI that approximately 400 drums were stored in the yard. (There is no indication of the area that these drums covered; assuming no stacking and a three-foot diameter per drum, 100 drums would cover approximately 900 square feet.) Remediation efforts conducted by a contractor for KMCO in 1987 created a waste pile of approximately 40 feet by 30 feet consisting of contaminated soil mixed with fly ash for solidification. According to TWC (1987c), due to contract difficulties, this waste pile was left on-site. It is unclear whether the waste pile was ever removed. At the time of the VSI, the salvage yard was covered with scrap facility equipment and scrap materials and the remaining waste pile was not observed; the drums and un-spilled succinic acid still-bottoms were removed in 1987.

Status

The Inactive Waste Pile in the Salvage Yard is currently inactive and is covered with facility equipment and scrap materials. The regulatory status of this unit is uncertain. The unit may be regulated under 40 CFR Part 264, Subpart L - Waste Piles.

Waste Type

The 55-gallon drums stored succinic acid still-bottoms (tetra propylene succine anhydrides, Philbin and Associates, P.C., 1988) produced in a discontinued process. The waste pile (which may or may not have been removed) consists of soil contaminated with this material and fly ash mixed with the soil for solidification. Philbin and Associates estimated that it mixed approximately 200 cubic yards of the still-bottoms with fly ash.

Waste Management

KMCO stored 55-gallon drums of the still-bottoms on the bare soil between 1982 and 1987. The drums and their remaining contents were removed in 1987 and disposed by Chemical Waste Management at its Sulphur, Louisiana hazardous waste landfill (Chemical Waste Management, 1987, and KMCO personnel interviewed during the VSI). It is unclear whether the waste pile was ever excavated and removed. No wastes, with the possible exception of the waste pile, were managed in the salvage yard at the time of the VSI.

Environmental Releases

TWC, in several documents (1987a, b, c, and d, and 1989a), notes the existence of the drums (some leaking), the contaminated waste pile, and surface soil contamination. No releases to surface water or ground water were noted.

Remedial Action Taken

KMCO hired Chemical Waste Management in 1987 to remove the drums and their remaining contents, stabilize the still-bottoms that had leaked from the drums and contaminated soil underlying the drums, and remove the stabilized materials. According to TWC (1987c, 1989a), as of October 15, 1987, due to "contract difficulties", the waste pile resulting from the stabilization process had been left in-place. KMCO, during the January 30, 1992 VSI, stated that Chemical Waste Management had excavated the contaminated area's soil (including the waste pile, presumably) down to a depth of eight feet and deposited new soil in its place. KMCO showed ICF receipts for this work in 1988; no documents verifying this were identified during the November, 1991 file search. Neither contaminated soil nor the waste pile could be observed during the VSI due to the overlying equipment and scrap materials.

Suggested Action

ICF recommends a RFI of the salvage yard and the inactive waste pile and/or contaminated soil that may remain.

Reasons

Because there is no complete documentation of the remedial activities in the salvage yard, no evidence exists that the waste pile and contaminated soil were remediated in a manner approved by the TWC or U.S. EPA. Therefore, the waste pile is assumed to not be formerly "closed" under RCRA. Furthermore, because the drum storage area and waste pile were earthen and unlined, seepage to subsurface soils of still-bottoms released from the drums while the area was active and seepage of precipitation through the waste pile may have occurred.

5.0 AREAS OF CONCERN

This section discusses two areas of concern (AOCs) identified by ICF after the PR and VSI. An AOC is not necessarily a solid waste management unit (SWMU); however, such an area either is potentially contaminated or provides a contaminant release pathway. All of the AOCs are identified in Appendix B.

5.1 AOC NO. 1 - EMPTY DRUM STORAGE AREA ALONG NORTHERN BORDER OF THE FACILITY (Photographs 32 and 33)

There is an empty drum storage area located along the northern border of the KMCO facility. During the January 30, 1992 VSI, the empty drums were stored along the edge of the cement pad which has a six-inch concrete berm. There were two rows of drums stacked two high. According to Mr. Maguire, all the drums were empty and sealed. Some drums are rinsed before they are stacked; if a drum is to be filled with the same product as before, it is sometimes stored un-rinsed. Mr. Maguire stated that the drums are picked up once a month by Evans-Cooperidge. During the VSI, ICF noted that this empty drum storage area was adjacent to a drainage ditch that flows directly into the county waters. This ditch is not a part of the Stormwater Collection Ditch (SWMU No. 14.3) and is present to prevent run-on. The water in the drainage ditch is not treated. ICF personnel noted that if a drum was jarred and fell into the ditch, it could rupture and cause an uncontained environmental release. These drums could be easily jarred by a high winds event, or an accidental bump by a truck loading the drums.

ICF recommends that the drums be moved ten feet away from the edge of the concrete pad. This action would prevent a fallen drum from rupturing in the drainage ditch. If a drum did fall and rupture, any spillage would be contained on the concrete pad.

5.2 AOC NO. 2 - GREEN HOPPER FOR MANAGING DIATOMACEOUS EARTH (Photograph 34)

An open hopper that contained a black, sludge material was observed in the northeast corner of the facility during the January 30, 1992 VSI. The black material coated the sides of the hopper and there was a tyvek suit and other paper wastes disposed of in the hopper. Mr. Maguire informed us that the hopper had been used for managing diatomaceous earth. The hopper was five feet by five feet and three feet deep with wheels affixed to the bottom. It was painted green and constructed of steel. The hopper was stored uncovered in an open area and there was an inch of standing rainwater. The hopper appeared to be watertight with no signs of drippage. There were no other signs of leakage around the hopper.

ICF recommends that KMCO store this hopper in a covered area. It is possible that heavy rain could cause a release from the hopper. Storage in a covered area would prevent such an occurrence.

6.0 HUMAN AND ENVIRONMENTAL TARGETS

This section discusses the potential human and environmental targets of a release of hazardous material into the environment from SWMUs at KMCO, Inc. Potential pathways include air, soil, subsurface gas, surface water, and ground water.

6.1 AIR

The potential impact of permitted emissions on employees or individuals in surrounding communities is not known because of a lack of data characterizing these emissions and their probable effects. The nearest residential area is 500 feet to the south of the facility.

Accidental releases to the atmosphere are a general source of concern, as demonstrated by the current lawsuit regarding the release of boron trifluoride.

6.2 SOIL

In general, soil contamination is possible around any of the Stormwater and Spill Collection Sumps (SWMU No. 14.2) and beneath the Facility Wide Concrete Pad (SWMU No. 14.1) and the Stormwater Collection Ditch (SWMU No. 14.3) if the integrity of these SWMUs is compromised. A full determination of the integrity of these SWMUs was not possible during the VSI.

Soil contamination is possible beneath the Inactive Surface Impoundment (SWMU No. 21) that underlies the 700-series tank farm, because the impoundment was unlined and no documentation exists for its proper remediation. Soil contamination is possible beneath the Inactive Waste Pile in the Salvage Yard (SWMU No. 22), because the waste pile is unlined and documentation suggests that it was improperly remediated.

Soil contamination is possible if the Stormwater Collection Ditch (SWMU No. 14.3) overflows in a heavy storm.

6.3 SUBSURFACE GAS

No evidence has been found suggesting that subsurface gas generation and migration is a potential problem at KMCO.

6.4 SURFACE WATER

Potential contamination of surface water surrounding the facility is possible given a substantial rainstorm. Although a pump is installed at the southern end of the Stormwater Collection Ditch (SWMU No. 14.3) that, according to KMCO, can rapidly draw down the contents of the ditch, if the pump were to fail during a storm, the ditch may overflow into the unnamed state-owned ditch on the facility's southern border. The water would have to flow for less than a mile before it would enter Jackson Bayou.

6.5 GROUND WATER

As for soil, ground-water contamination is possible around any of the Stormwater and Spill Collection Sumps (SWMU No. 14.2), beneath the Facility Wide Concrete Pad (SWMU No. 14.1), and beneath the Stormwater Collection Ditch (SWMU No. 14.3) if the integrity of these SWMUs is compromised. A full determination of the integrity of these SWMUs was not possible during the VSI.

Ground-water contamination is possible beneath the Inactive Surface Impoundment (SWMU No. 21) that underlies the 700-series tank farm, because the impoundment was unlined and no documentation exists for its proper remediation. Ground-water contamination is possible beneath the Inactive Waste Pile in the Salvage Yard (SWMU No. 22), because the waste pile is unlined and documentation suggests that it was improperly remediated.

Ground-water contamination is possible if the Stormwater Collection Ditch (SWMU No. 14.3) overflows in a heavy storm.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Twenty-two SWMUs and two AOCs have been identified at KMCO, Inc. All but five SWMUs are active. The active SWMUs and AOCs include:

- SWMU No. 1, Bulk Storage Area for Diatomaceous Earth (2)
- SWMU No. 2, Storage Tank T-1
- SWMU No. 3, Storage Tank T-2
- SWMU No. 4, Storage Tank T-406
- SWMU No. 5, Storage Tank T-596
- SWMU No. 7, Storage Tank T-26
- SWMU No. 8, Storage Tank T-007
- SWMU No. 9, Storage Tank T-5
- SWMU No. 10, Storage Tank T-0019
- SWMU No. 11, Storage Tank T-602
- SWMU No. 12, Storage Tank T-3
- SWMU No. 13, Waste Oil Storage Tank
- SWMU No. 14, Stormwater and Spill Collection System
- SWMU No. 14.1, Facility Wide Concrete Pad
- SWMU No. 14.2, Stormwater and Spill Collection Sumps
- SWMU No. 14.3, Stormwater Collection Ditch
- SWMU No. 15, Wastewater Treatment Plant
- SWMU No. 15.1, Adjusting Tanks (2-20,000 gallon)
- SWMU No. 15.2, Anaerobic Digester (20,000 gallon)
- SWMU No. 15.3, Equalization Tank (1,000,000 gallon)
- SWMU No. 15.4, Aeration Tank (750,000 gallon)
- SWMU No. 15.5, Clarifier (30,000 gallon)
- SWMU No. 15.6, Sand Filter
- SWMU No. 15.7, Charcoal Filters (3)
- SWMU No. 15.8, Chlorine Contact Chamber
- SWMU No. 16, Drip Pans
- SWMU No. 17, Solvent Satellite Collection Drum
- SWMU No. 18, Roll-Off Bins for Miscellaneous Solid Wastes (2)
- SWMU No. 19, Roll-Off Bin for Crushed Drums
- AOC No. 1, Empty Drum Storage Area Along the Northern Border of the Facility
- AOC No. 2, Green Hopper for Collecting Diatomaceous Earth

In general, all SWMUs, with some exceptions, appeared to be in good condition. Several cracks were noted in the Facility Wide Concrete Pad during the VSI; the depth of these cracks could not be determined. Several stains and small spills due to leaking valves and pumps were noted; these discharged onto the concrete pad. KMCO indicated that the sumps were operating properly, but ICF was unable to visually inspect them below grade. ICF was unable to observe the Inactive Surface Impoundment (SWMU No. 21) because it underlies the 700-series tank farm. ICF was also unable to observe the Inactive Waste Pile in the Salvage Yard (SWMU No. 22) because it was covered with equipment and scrap materials.

Table 7-1 summarizes the status, waste type, waste management, releases, migration pathways, and remedial actions for all SWMUs and AOCs.

TABLE 7-1 - SWMU AND AOC SUMMARY

Unit	SWMU No. 1	SWMU No. 2	SWMU No. 3
Unit Name	Bulk Storage Area for Diatomaceous Earth (2)	Storage Tank T-1	Storage Tank T-2
Description	Two 20-cubic yard roll-off bins that catch filtered solids underneath a filter press. Located on cement pad within dikes.	Above-ground, 10,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include berms and daily measurement of tank level.	Above-ground, 10,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include berms and daily measurement of tank level.
Operating Status	Active	Active	Active
Regulatory Status	Registered as active with the TWC (on the NOR).	Registered as active with the TWC (on the NOR).	Registered as active with the TWC (on the NOR).
Waste Type	Diatomaceous earth filter aid, absorbent wastes	High-strength distillation wastewater (COD level above 100,000 mg/L)	Low-strength distillation wastewater (COD levels below 100,000 mg/L)
Waste Management	Wastes fall directly into the bins from the filters above, absorbent wastes are scooped up and placed into the bins by hand. When full, loaded onto a trailer and disposed of off-site by Chemical Waste Management.	High-strength wastewater from the distillation areas are stored in this tank, picked up by a tanker, and disposed of off-site in EMPAK's deep injection well.	Low-strength wastewater from the distillation areas is stored in this tank. From the tank, it is pumped to the on-site Wastewater Treatment Plant (SWMU No. 15) for treatment.
Release History	None	None	None
Release Pathway	None	None	None
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.
Reason for Release Potential Rating	Adequate secondary containment, and on a concrete pad.	On a concrete pad, and has two forms of secondary containment.	On concrete pad, and has two forms of secondary containment.
Need for RFI	No	No	No

Table 7-1 (cont.)

Unit	SWMU No. 4	SWMU No. 5	SWMU No. 6
Unit Name	Storage Tank T-406	Storage Tank T-596	Storage Tank T-713
Description	Above-ground, 10,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include berms and daily measurement of tank level.	Above-ground, 6,300-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include berms and daily measurement of tank level.	Above-ground, 6,300-gallon, closed top, carbon-steel tank. Located on concrete pad. Concrete berms around the tank provide secondary containment.
Operating Status	Active	Active	Inactive
Regulatory Status	Registered as active with the TWC (on the NOR).	Registered as active with the TWC (on the NOR).	Registered as active with the TWC (on the NOR).
Waste Type	High-strength reaction wastewater (COD level above 100,000 mg/L)	High-strength distillation wastewater (COD level above 100,000 mg/L)	Reaction wastewater
Waste Management	High-strength reaction wastewater is stored in the tank. When the tank is full (in less than 90 days), the wastewater is pumped into a tanker truck and disposed of off-site at EMPAK's deep injection well.	High-strength distillation wastewater is stored in the unit until it is full (less than 90 days). The wastewater is then pumped into a tanker truck and disposed of off-site at EMPAK's deep injection well.	KMCO personnel stated that the tank was empty an held no wastes. This was impossible to confirm.
Release History	None	None	None
Release Pathway	None	None	None
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.
Reason for Release Potential Rating	On concrete pad, two forms of secondary containment.	On concrete pad, two forms of secondary containment.	On concrete pad, two forms of secondary containment.
Need for RFI	No	No	No

Table 7-1 (cont.)

Unit	SWMU No. 7	SWMU No. 8	SWMU No. 9
Unit Name	Storage Tank T-26	Storage Tank T-007	Storage Tank T-5
Description	Above-ground, 20,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include concrete berms around the tank and daily measurement of the tank level.	Above-ground, 20,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include concrete berms around the tank and daily measurement of the tank level.	Above-ground, 20,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include concrete berms around the tank and daily measurement of the tank level.
Operating Status	Active	Active	Active
Regulatory Status	Registered as active with the TWC (on the NOR).	Registered as active with the TWC (on the NOR).	Registered as active with the TWC (on the NOR).
Waste Type	Low-strength distillation wastewater (COD level below 100,000 mg/L)	High-strength distillation wastewater (COD level above 100,000 mg/L)	Low-strength distillation wastewater (COD level below 100,000 mg/L)
Waste Management	Low-strength wastewater from the distillation areas is stored in this tank. From the tank, it is pumped to the on-site Wastewater Treatment Plant (SWMU No. 15) for treatment.	High-strength distillation wastewater is stored in the unit until it is full (less than 90 days). The wastewater is then pumped into a tanker truck and disposed of off-site at EMPAK's deep injection well.	Low-strength wastewater from the distillation areas is stored in this tank. From the tank, it is pumped to the on-site Wastewater Treatment Plant (SWMU No. 15) for treatment.
Release History	None	None	None
Release Pathway	None	None	None
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, ground water.
Reason for Release Potential Rating	This tank has two forms of secondary containment and is on a concrete pad.	This tank has two forms of secondary containment and is on a concrete pad.	This tank has two forms of secondary containment and is on a concrete pad.
Need for RFI	No	No	No

Table 7-1 (cont.)

Unit	SWMU No. 10	SWMU No. 11	SWMU No. 12
Unit Name	Storage Tank T-0019	Storage Tank T-602	Storage Tank T-3
Description	Above-ground, 30,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include concrete berms around the tank and daily measurement of the tank level.	Above-ground, 20,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include concrete berms around the tank and daily measurement of the tank level.	Above-ground, 20,000-gallon, closed top, carbon-steel tank. Located on concrete pad. Two forms of secondary containment include concrete berms around the tank and daily measurement of the tank level.
Operating Status	Active	Active	Active
Regulatory Status	Registered as active with the TWC (on the NOR).	Registered as active with the TWC (on the NOR).	Not a registered waste storage tank.
Waste Type	Contained glycol product stream at the time of the January 30, 1992 VSI.	Low-strength distillation wastewater (COD level below 100,000 mg/L)	Low-strength distillation wastewater (COD level below 100,000 mg/L)
Waste Management	No wastes are currently managed in this unit.	Low-strength wastewater from the distillation areas is stored in this tank. From the tank, it is pumped to the on-site Wastewater Treatment Plant (SWMU No. 15) for treatment.	Low-strength wastewater from the distillation areas is stored in this tank. From the tank, it is pumped to the on-site Wastewater Treatment Plant (SWMU No. 15) for treatment.
Release History	None	None	None
Release Pathway	None	None	None
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.
Reason for Release Potential Rating	This tank has two forms of secondary containment and is on a concrete pad.	This tank has two forms of secondary containment and is on a concrete pad.	This tank has two forms of secondary containment and is on a concrete pad.
Need for RFI	No	No	No

Table 7-1 (cont.)

Unit	SWMU No. 13	SWMU No. 14.1	SWMU No. 14.2
Unit Name	Waste Oil Storage Tank	Facility Wide Concrete Pad	Stormwater and Spill Collection Sumps
Description	Above-ground, 500-gallon, closed top, horizontal carbon-steel tank. Located on concrete pad. Two forms of secondary containment include concrete berms around the tank and daily measurement of the tank level.	Concrete spill pad that underlies the entire facility. The pad collects stormwater and spills for treatment. The pad includes berms which surround each process area. A berm surrounding the entire facility provides secondary containment for the pad. The pad is in fair condition but there are cracks in places. The pad is frequently inspected and cracks are repaired. Semi-annually, a worn area of the pad is replaced.	There are approximately 25 sumps around the KMCO facility. They are two feet deep by five feet in diameter, constructed of concrete, and covered with steel grates. The sumps are cleaned and inspected every two to three months for cracks by KMCO personnel. ICF could not confirm the integrity of the sumps.
Operating Status	Active	Active	Active
Regulatory Status	Notified TWC as active (NOR not yet updated).	Unregulated	Unregulated
Waste Type	Spent industrial grade oil (motor oil) used for lubricating the pumps.	Spills and stormwater that may contain any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.	Spills and stormwater that may contain any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.
Waste Management	Used oil is pumped directly into the tank from the pumps. Sometimes poured into the tank by hand through a bung which is kept closed. Tank is emptied by Jones Oil when full (once a month) for off-site recovery.	Stormwater and spills collect on the concrete pad. They can flow to the Stormwater and Spills Collection Sumps (SWMU No. 14.2). The sumps pump the stormwater to the Wastewater Treatment Plant for on-site treatment.	Stormwater and spills flow into the sumps from the Facility Wide Concrete Pad (SWMU No. 14.1). The sumps pump the stormwater into the Stormwater Collection Ditch (SWMU No. 14.3) which flows to the Wastewater Treatment Plant.
Release History	There was an used oil release in 1989. The release was caused by a heavy rain event. It was contained within the stormwater collection system, diverted to SWMU No. 14, and remediated.	None	None
Release Pathway	Unknown	None	None
Remedial Action Taken	Oil was recovered from the stormwater collection system with a vacuum truck. Pipes were installed to pump used oil directly into the tank so that the tank can be kept closed.	None	None
Release Potential	Low	Medium	Medium
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Surface water, soil, and ground water.	Soil, and ground water.
Reason for Release Potential Rating	There are two forms of secondary containment and the tank is on a concrete pad. The waste oil tank is now kept closed.	The pad is in contact with a good deal of contaminants in collecting stormwater and spills. The pad is in fair condition, but it is cracked in many places. The pad is inspected frequently by KMCO personnel and cracks are patched. Semi-annually, a worn area of the pad is replaced.	ICF was unable to confirm the integrity of the sumps, which are continually in contact with contaminants from spills and stormwater. The sumps are inspected every two to three months and cracks are patched. Sumps in poor condition are sometimes replaced.
Need for RFI	No	Yes	Conditional, if documentation of integrity tests cannot be provided.

Table 7-1 (cont.)

Unit	SWMU No. 14.3	SWMU No. 15.1	SWMU No. 15.2
Unit Name	Stormwater Collection Ditch	Adjusting Tanks (2)	Anaerobic Digester
Description	Concrete lined ditch along the western border of the facility that conveys stormwater to the Wastewater Treatment Plant (WTP) (SWMU No. 15). The ditch was in fair condition, although it was cracked in places. There are no reports or evidence of the ditch overflowing.	Adjusting Tanks are two 20,000-gallon, above-ground, open top, carbon-steel tanks. They are located on the concrete pad, within the berms surrounding the Wastewater Treatment Plant. The tanks have high level alarms. They are in good condition.	The Anaerobic Digester is a 21,000-gallon, above-ground, closed top, carbon-steel tank. It is located on the concrete pad, within the berms surrounding the Wastewater Treatment Plant. The tank level is checked daily. It is in good condition with some surface rust along the bottom of the tank.
Operating Status	Active	Active	Active
Regulatory Status	Unregulated	Exempt from RCRA regulations. TWC permitted.	Exempt from RCRA regulations. TWC permitted.
Waste Type	Spills and stormwater that may contain any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.	The Equalization Tanks contain concentrated wastewater that is the low-strength wastewater from process areas. This wastewater has COD of less than 100,000 mg/L and can contain contaminants from any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.	The Anaerobic Digester treats concentrated wastewater that has had chemicals added to equalize the pH. This wastewater has COD of less than 100,000 mg/L and can contain contaminants from any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.
Waste Management	Contaminated stormwater is pumped into the ditch from the sumps located around the KMCO facility (SWMU No. 14.2). The ditch conveys the wastewater to the WTP where three pumps transfer the water into the WTP Equalization Tank (SWMU No. 15.3).	Concentrated wastewater is stored in waste storage tanks (SWMU Nos. 2-12). It is pumped directly from the tanks into the adjustment tanks. In the tanks, chemicals are added to equalize the pH before the wastewater is sent to the Anaerobic Digester (SWMU No. 15.2).	The pH of the concentrated wastewater is equalized in the adjustment tanks (SWMU No. 15.1). The water is pumped to the digester where anaerobic organisms degrade the contaminants and lower the COD level. From the digester, the wastewater is pumped to the Equalization Tank (SWMU No. 15.3) for further treatment.
Release History	None	None	None
Release Pathway	None	None	None
Remedial Action Taken	None	None	None
Release Potential	Medium	Low	Low
Potential Pathway	Surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.
Reason for Release Potential Rating	The Stormwater Collection Ditch is open and the possibility exists for the ditch to overflow into neighboring soil or into an unnamed ditch off KMCO property that flows untreated to the San Jacinto River. In addition, the ditch is cracked and liquid may be seeping into the soil matrix.	The Adjusting Tanks are in good condition and only contain wastewater. In addition, the tanks have two forms of secondary containment (alarm and berms).	The Anaerobic Digester is in good condition and only contains wastewater. In addition, the tank has two forms of secondary containment (daily level measurement and berms).
Need for RFI	Yes	No	No

Table 7-1 (cont.)

Unit	SWMU No. 15.3	SWMU No. 15.4	SWMU No. 15.5
Unit Name	Equalization Tank	Aeration Tank	Clarifier
Description	The Equalization Tank is a 1,000,000-gallon, above-ground, open top, lined carbon-steel tank. It is located on the concrete pad, within the berms surrounding the Wastewater Treatment Plant. The tank has a high level alarm. It is in good condition.	The Aeration Tank is a 1,000,000-gallon, above-ground, open top, lined carbon-steel tank. It is located on the concrete pad, within the berms surrounding the Wastewater Treatment Plant. The tank has a high level alarm. It is in good condition.	The Clarifier is a 36,000-gallon, above-ground, open top, carbon-steel tank. It is located on the concrete pad, within the berms surrounding the Wastewater Treatment Plant. The tank has a high level alarm. It is in good condition.
Operating Status	Active	Active	Active
Regulatory Status	Exempt from RCRA regulations. TWC permitted.	Exempt from RCRA regulations. TWC permitted.	Exempt from RCRA regulations. TWC permitted.
Waste Type	The Equalization Tank contains effluent from the Anaerobic Digester (SWMU No. 15.2) and stormwater collected in the Stormwater and Spill Collection System (SWMU No. 14). This wastewater can contain contaminants from any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.	The Aeration Tank contains effluent from the Equalization Tank (SWMU No. 15.3). This wastewater can contain contaminants from any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.	The Clarifier contains effluent from the Aeration Tank (SWMU No. 15.4). This wastewater should have a COD level of less than the permitted outfall level of 480 mg/L. It can contain contaminants from any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.
Waste Management	Digester effluent and contaminated stormwater are pumped into the Equalization Tank. In the tank, the different streams come to a common temperature and concentration. The wastewater is then pumped to the Aeration Tank (SWMU No. 15.4).	Equalization Tank effluent is pumped into the Aeration Tank. In the tank, oxygen is introduced and the contaminants degraded by aerobic micro-organisms. The wastewater then flows to the Clarifier (SWMU No. 15.5).	Aeration Tank effluent flows into the Clarifier. In the tank, the solids settle out. The liquid flows out of the Clarifier and into the either the Sand Filter (SWMU No. 15.6), a Charcoal Filter (SWMU No. 15.7), or the Chlorine Contact Chamber (SWMU No. 15.8).
Release History	None	None	None
Release Pathway	None	None	None
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.
Reason for Release Potential Rating	The Equalization Tank is in good condition and contains dilute wastewater. In addition, the tank has two forms of secondary containment (alarm and berms).	The Aeration Tank is in good condition and contains dilute wastewater. In addition, the tank has two forms of secondary containment (alarm and berms).	The Clarifier is in good condition and contains dilute wastewater. In addition, the tank has two forms of secondary containment (alarm and berms).
Need for RFI	No	No	No

Table 7-1 (cont.)

Unit	SWMU No. 15.6	SWMU No. 15.7	SWMU No. 15.8
Unit Name	Sand Filter	Charcoal Filters (3)	Chlorine Contact Chamber
Description	The Sand Filter is a sealed, cylindrical, carbon-steel tank filled with sand. The filter is on steel legs above the concrete pad, within the berms surrounding the Wastewater Treatment Plant. The filter is in good condition.	The Charcoal Filters are sealed, cylindrical, carbon-steel vessels that hold approximately 100 gallons. The filters sit on steel legs above the concrete pad, within the berms surrounding the Wastewater Treatment Plant. The filters are in good condition.	The Chlorine Contact Chamber is a sealed, 200-gallon, cylindrical, carbon-steel vessel. The chamber sits directly on the concrete pad, within the berms surrounding the Wastewater Treatment Plant. The chamber is in good condition.
Operating Status	Active	Active	Active
Regulatory Status	Exempt from RCRA regulations. TWC permitted.	Exempt from RCRA regulations. TWC permitted.	Exempt from RCRA regulations. TWC permitted.
Waste Type	The Sand Filter polishes treated wastewater from the Clarifier (SWMU No. 15.5). The wastewater will have a COD below 480 mg/L.	The Charcoal Filters polish treated wastewater from the Clarifier (SWMU No. 15.5). The wastewater will have a COD below 480 mg/L.	The Chlorine Contact Chamber polishes treated wastewater from the Clarifier (SWMU No. 15.5). The wastewater will have a COD below 480 mg/L.
Waste Management	Water from the Clarifier flows to the Sand Filter. It is used in times of heavy rains to speed the treatment time and relieve the stress on the other elements of the Wastewater Treatment Plant. The water passes through the sand matrix and is pumped into the Chlorine Contact Chamber.	Water from the Clarifier flows to the Charcoal Filter. The filters are in series, and the number in use depends on the loading of the Wastewater Treatment Plant. In times of heavy rains, two or more are used to speed the treatment time. The water passes through the Charcoal Filters and is then pumped into the Chlorine Contact Chamber.	Water from the Clarifier flows into the Chlorine Contact Chamber. It is mixed with chlorine gas in a chlorine injection loop. Chlorinated effluent then flows through a calibrated trough (for flow rate measurement) and into an off-site unnamed ditch.
Release History	None	None	None
Release Pathway	None	None	None
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.
Reason for Release Potential Rating	The Sand Filter is in good condition and contains treated wastewater. In addition, the tank has secondary containment provided by concrete berms.	The Charcoal Filters are in good condition and contains treated wastewater. In addition, the tank has secondary containment provided by concrete berms.	The Chlorine Contact Chamber is in good condition and contains treated wastewater. In addition, the tank has two forms of secondary containment (alarm and berms).
Need for RFI	No	No	No

Table 7-1 (cont.)

Unit	SWMU No. 15.9	SWMU No. 16	SWMU No. 17
Unit Surge Tank	Drip Pans	Solvent Satellite Collection Drum	
Description	The Surge Tank is a 20,000-gallon, above-ground, closed top, carbon-steel tank. It is located on the concrete pad, within the berms surrounding the Wastewater Treatment Plant. It is in good condition.	Ten 20-gallon, quarter-inch thick carbon-steel, open rectangular pans positioned beneath many pipe manifolds. The pans are within the bermed process areas and located on the cement pad. The pans are in good condition.	SWMU consisted of a closed 55-gallon drum. The drum was labelled "Used solvent." It was located directly on the concrete pad without a pallet.
Operating Status	Inactive	Active	Active
Regulatory Status	Exempt from RCRA regulations. TWC permitted.	Unregulated	Unregulated
Waste Type	KMCO personnel stated that the Surge Tank, currently, does not contain any wastes. In the past, it was used to hold treated water (effluent from the Wastewater Treatment Plant) for use as utility and fire water.	Any feed, product, or waste stream handled by KMCO including glycols, glycol ethers, amines, petroleum products, and other organics.	Spent solvent from use in cleaning and maintaining equipment such as pumps.
Waste Management	The Surge Tank is not used to manage any wastes. In the past, treated water was stored in the tank for use as utility and fire water.	The Drip Pans collect spillage created during routine pumping procedures such as drainage from hoses. When full, the pans are emptied back into the process tanks and the contents are reprocessed. If the pan contents are contaminated, they are pumped to a high-strength wastewater storage tank and disposed of off-site.	Used solvent is emptied into the drum by hand from cleaning equipment. The drum is picked up and disposed of off-site by Safety-Kleen.
Release History	None	None	None
Release Pathway	None	None	None
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.
Reason for Release Potential Rating	The Equalization Tank is in good condition and does not contain any wastes. In addition, the tank has two forms of secondary containment (alarm and berms).	The Drip Pans are in good condition and secondary containment, provided by concrete berms, prevents release.	The drum was in good condition and was closed, however the only form of secondary containment around the drum is the concrete pad.
Need for RFI	No	No	No

Table 7-1 (cont.)

Unit	SWMU No. 18	SWMU No. 19	SWMU No. 20
Unit Name	Roll-off Bins for Misc. Solid Wastes (2)	Roll-Off Bin for Crushed Drums	Container Storage Area for Absorbent Wastes
Description	Two 20-cubic yard roll-off bins that are used to dispose of miscellaneous solid wastes. The bins are uncovered. Both bins are located in the northern part of the facility on the concrete pad but are not surrounded by berms.	20-cubic yard roll-off bin that is used to dispose of crushed drums. The bin is covered. It is located in the northwestern corner of the facility. It is located on the concrete pad but not surrounded by berms.	Concrete area used to store containers of wastes before off-site disposal. The area is not surrounded by berms nor is there any other secondary containment. The area has not been used since 1990.
Operating Status	Active	Active	Inactive
Regulatory Status	Unregulated	Unregulated	Registered as active with the TWC (on the NOR).
Waste Type	Miscellaneous solid wastes such as packaging and other non-hazardous material.	Worn, 55-gallon product and feed drums. The drums are rinsed and cleaned according to EPA guidelines.	Absorbent wastes such as absorbent pads and pellets used to clean up small spills.
Waste Management	Wastes are placed into the bins by hand. The bins are placed onto a trailer when full and disposed of off-site by Mayfield.	Clean drums are crushed and put into the bin by hand. The bin is loaded onto a trailer when full and disposed of off-site by BFI.	In the past, absorbent wastes were collected in hoppers and packed into containers including drums and dumpsters. The containers were picked up and disposed of off-site. These wastes are now disposed of in the Bulk Storage Area for Diatomaceous Earth (SWMU No. 1).
Release History	None	None	A heavy rain event caused a spill of approximately 100 gallons of oil. The oil ran off the cement pad of the container storage area into an off-site drainage ditch along the northern border of the facility. Soil and possibly surface water in the drainage ditch were contaminated.
Release Pathway	None	None	Surface water and soil.
Remedial Action Taken	None	None	Contaminated soil removed and disposed of off-site.
Release Potential	Medium	Low	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.	Surface water, soil, ground water.
Reason for Release Potential Rating	The roll-off bins are uncovered and the only form of secondary containment is the concrete pad. The bins do not hold hazardous wastes.	The roll-off bin is covered minimizing water entering the bin. The only form of secondary containment is the concrete pad. The wastes in the bin are non-hazardous.	The container storage area is no longer utilized. There are few reports of releases from the area, and the one documented release was remediated by KMCO.
Need for RFI	No	No	No

Table 7-1 (cont.)

Unit	SWMU No. 21	SWMU No. 22	AOC No. 1
Unit Name	Inactive Surface Impoundment	Inactive Waste Pile in the Salvage Yard	Empty Drum Storage Area Along the Northern Border of the Facility
Description	The Inactive Surface Impoundment is located beneath the Facility Wide Concrete Pad and the 700-series tank farm. The impoundment was used before 1985 to store, treat, and recirculate contaminated contact cooling water. Its former size and depth are unknown.	The inactive waste pile is located in the salvage yard to the east of Ramsey Road, across from KMCO's main office. KMCO formerly stored up to 800 55-gallon drums of succinic acid still-bottoms, some of which were leaking. The drums were removed in 1987. Released still-bottoms and contaminated soil may remain in-place.	The area consists of two rows of empty 55-gallon feed drums stacked two drums high. The drums were closed and in good condition. The drums are located on the concrete pad and there is a six inch concrete berm at the edge of the pad. However, the drums are located five feet from an off-site drainage ditch.
Operating Status	Inactive	Inactive	Active
Regulatory Status	Uncertain	Uncertain	Unregulated
Waste Type	Contaminated contact cooling water with COD concentrations of about 9,000 mg/L.	Still-bottoms and contaminated sludge stabilized with fly ash. Contaminated area is approximately 40 feet by 30 feet.	Some of the drums have been rinsed; others could contain residues of most feed streams handled by KMCO, including glycols, glycol ethers, amines, petroleum products, and other organics.
Waste Management	Contact cooling waters were discharged into the impoundment, treated with unknown materials, and allowed to cool before recirculating to the process area.	Drums were stored uncovered on an unlined portion of the salvage yard.	The drums are stacked along the northern border of the facility. Some drums are rinsed before being stacked. Drums that will be reused for the same chemicals are not rinsed and may contain some residues. Empty drums are picked up once a month.
Release History	Texas Department of Water Resources noted "evidence of discharges off site without a permit as prohibited by TAC 335.4" in a 1984 inspection.	Texas Water Commission noted discharges from the drums and contaminated soil (surface contamination).	None
Release Pathway	Unknown, assumed either surface water or directly to soil.	Soil, ground water.	None
Remedial Action Taken	None documented for event noted. KMCO discontinued use of impoundment in 1985 and subsequently filled it in with local material, covered it with the concrete pad, and installed the 700-series tank farm.	TWC confirms in several documents that soil were stabilized but left in place after contract disputes. KMCO stated that drums were removed, contaminated soil was removed to a depth of eight feet, and new was soil filled in.	None
Release Potential	High	High	Low
Potential Pathway	Soil, ground water	Soil, ground water	Surface water
Reason for Release Potential Rating	No documentation of the remedial action taken has been identified. No evidence exists that remediation was sound or was approved by TWC or U.S. EPA. Impoundment was earthen and unlined. No evidence exists to suggest that soil underlying impoundment were removed before backfilling.	Complete documentation of the remedial action taken has not been identified. No evidence exists that remediation was sound or was approved by TWC or U.S. EPA. Storage area was earthen and unlined, as was waste pile. No state or federal evidence has been identified to suggest that waste pile and soil underlying waste pile were removed before backfilling.	The drums are sealed and in good condition. Any leakage will be contained on the concrete pad. The pad was in good condition near the drums, and the berm prevents runoff into the ditch. A slight possibility exists that one of the drums could be bumped or otherwise fall into the drainage ditch and rupture, releasing directly to the surface water.
Need for RFI	Yes	Yes	No

Table 7-1 (cont.)

Unit	AOC No. 2
Unit Name	Green Hopper for Managing Diatomaceous Earth
Description	Open three feet deep by five feet by five feet square hopper constructed out of steel. The hopper contained a black, sludge material. There was rain water collecting at the bottom of the hopper. The hopper was located on the concrete pad with no other secondary containment.
Operating Status	Active
Regulatory Status	Unregulated
Waste Type	The black material is diatomaceous earth filter aid.
Waste Management	The hopper is used in some way to help manage diatomaceous earth filter aid. After each use, the hopper is emptied into the roll-off bin for diatomaceous earth (SWMU No. 1) for off-site disposal.
Release History	None
Release Pathway	None
Remedial Action Taken	None
Release Potential	Low
Potential Pathway	Stormwater and Spill Collection System (SWMU No. 14) to surface water, soil, and ground water.
Reason for Release Potential Rating	The hopper contains small amount of wastes and is emptied after each use. However, only the concrete pad exists for secondary containment. In addition, the hopper is open and could overflow in a heavy rain event.
Need for RFI	No

Based on the PR, VSI, and subsequent correspondence with facility personnel, a RCRA Facility Investigation is warranted for the following:

- Facility Wide Concrete Pad (SWMU No. 14.1)
- Stormwater and Spill Collection Sumps (SWMU No. 14.2) (conditional RFI)
- Stormwater Collection Ditch (SWMU No. 14.3)
- Inactive Surface Impoundment (SWMU No. 21)
- Inactive Waste Pile in the Salvage Yard (SWMU No. 22)

As a conditional RFI for KMCO's Stormwater and Spill Collection Sumps (SWMU No. 14.2), ICF recommends that KMCO submit documentation to verify the occurrence and results of its regular integrity tests for their sumps; if KMCO cannot provide documentation, ICF recommends a RCRA Facility Investigation to determine the integrity of all sumps.

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APPENDIX A

SUMMARY TRIP REPORT AND PHOTOGRAPHS

Summary Trip Report

An introductory meeting was held with KMCO, Inc. personnel on January 30, 1992 beginning at 8:00 a.m. and lasting approximately three hours. During the meeting, facility personnel discussed the history of the facility and the various processes and operations of the facility. They also discussed the wastes generated and various waste management practices at the facility. Larry Huffman, the ICF Field Team Leader, discussed the purpose of the site visit and planned the schedule for the VSI with the facility representatives.

The VSI was performed on January 30, 1992. The following individuals were present during the inspection:

Name	Representative of
Michael Maguire	KMCO, Inc.
Larry Huffman	ICF Incorporated
David Michelsen	ICF Incorporated

The inspection began at 11:00 a.m. The team first inspected a Stormwater and Spill Collection Sump (SWMU No. 14.2) and the Bulk Storage Area for Diatomaceous Earth (SWMU No. 1) in the northern portion of the facility. The team noted that the entire facility was underlain by a Facility-Wide Concrete Pad (SWMU No. 14.1) and that most facility components, including the bulk storage area, are located within bermed process areas.

The team then walked south to visit two waste storage tanks (SWMU Nos. 8 and 10). Both tanks were inside a bermed process area. The team learned that the liquid level of all tanks in the facility is checked daily. The team inspected dikes around the process area and found them to be in good condition. The team also inspected a second Stormwater and Spill Collection Sump (SWMU No. 14.2) adjacent to the two storage tanks.

The team continued south and noticed a 55-gallon drum marked as "used solvent". This drum is the Solvent Satellite Collection Drum (SWMU No. 17). The drum was not within a process area and was uncovered. The team proceeded to the southwest corner of the facility and inspected the Wastewater Treatment Plant (SWMU No. 15) and the Stormwater Collection Ditch (SWMU No. 14.3). All nine elements of the Wastewater Treatment Plant inspected were located on a concrete pad surrounded by berms between three and four feet high.

The team then backtracked across the facility towards the northeast. The team inspected a waste Storage Tank T-596 and a Drip Pan located in adjacent process areas (SWMU No. 5 and No. 16). These units were both elevated off the concrete pad and were inside a bermed process area. The team continued to the northeast corner of the facility and visited a cooling tower and a boiler. Both of these units did not handle wastes. The team discovered two Roll-Off Bins for Miscellaneous Solid Wastes (SWMU No. 18) located on the concrete pad near the boiler.

The team doubled back again and travelled southwest to visit a waste Storage Tank T-406 (SWMU No. 4) and the Waste Oil Storage Tank (SWMU No. 13). These tanks were both elevated off the concrete pad and were inside a bermed process area.

The RFA Team finished by inspecting the northern border of the facility. In the northwest corner, ICF inspected a Roll-Off Bin for Crushed Drums (SWMU No. 19), an Empty Drum Storage Area (AOC No. 1), and a Green Hopper for Managing Diatomaceous Earth (AOC No. 2).

A debriefing meeting was held at 3:30 p.m., and the RFA Team left the facility at 4:30 p.m.

Visual Site Inspection
Photograph Log
January 30, 1992

KMCO, Inc.
Crosby, Texas

Photographs were taken of all the SWMUs and Areas of Concern during the VSI, with the exception of the following SWMUs listed below. Photographs taken of areas that were later determined not to be SWMUs or Areas of Concern were not included in this report.

Photographs were not taken of the following SWMUs because of limited access that prevented the VSI team from photographing the SWMUs:

- SWMU No. 2, Storage Tank T-1
- SWMU No. 3, Storage Tank T-2
- SWMU No. 5, Storage Tank T-596
- SWMU No. 6, Storage Tank T-713
- SWMU No. 7, Storage Tank T-26
- SWMU No. 9, Storage Tank T-5
- SWMU No. 12, Storage Tank T-3

Photographs were not taken of the following SWMUs because at the time of the VSI, they were believed to not be SWMUs; however, following the VSI, they were determined to be SWMUs:

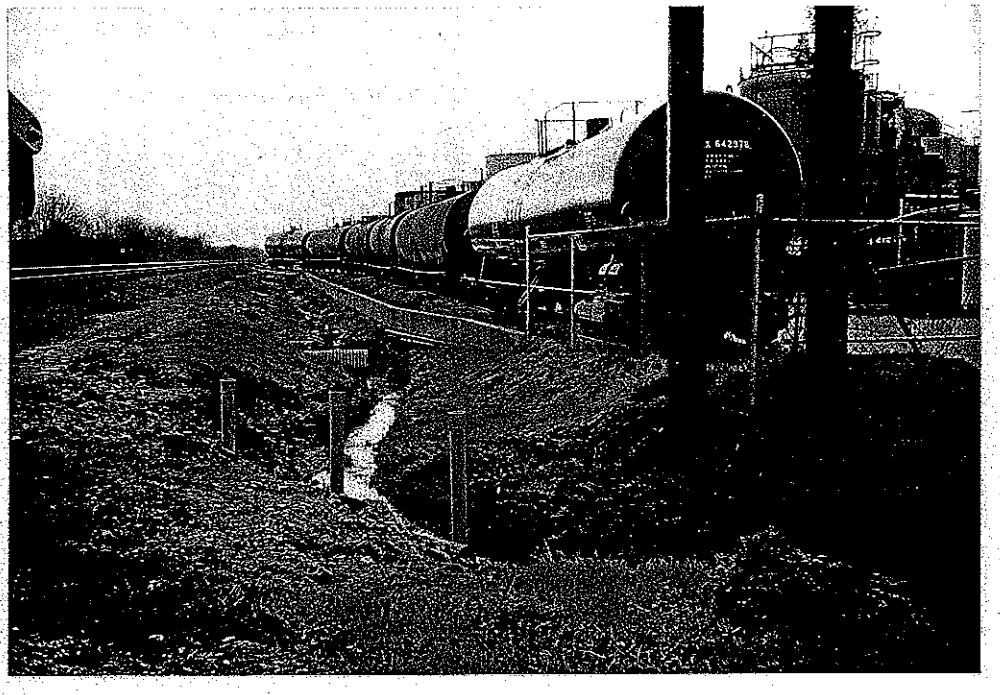
- SWMU No. 20, Container Storage Area for Absorbent Wastes
- SWMU No. 21, Inactive Surface Impoundment
- SWMU No. 22, Inactive Waste Pile in the Salvage Yard

Photographs were inadvertently not taken of the following SWMUs:

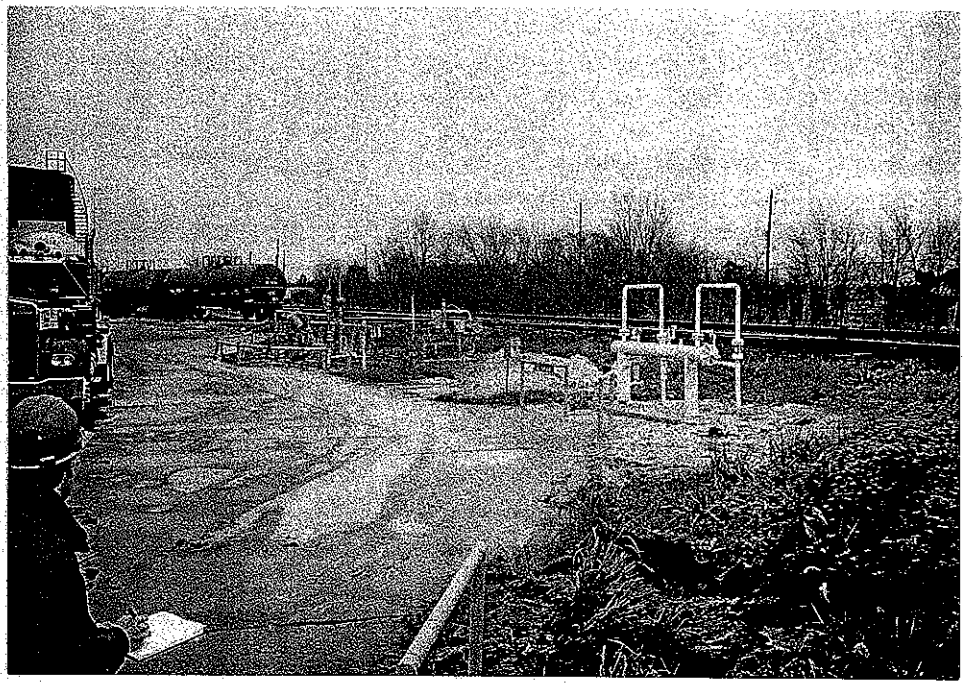
- SWMU No. 10, Storage Tank T-0019
- SWMU No. 11, Storage Tank T-602

APPENDIX B

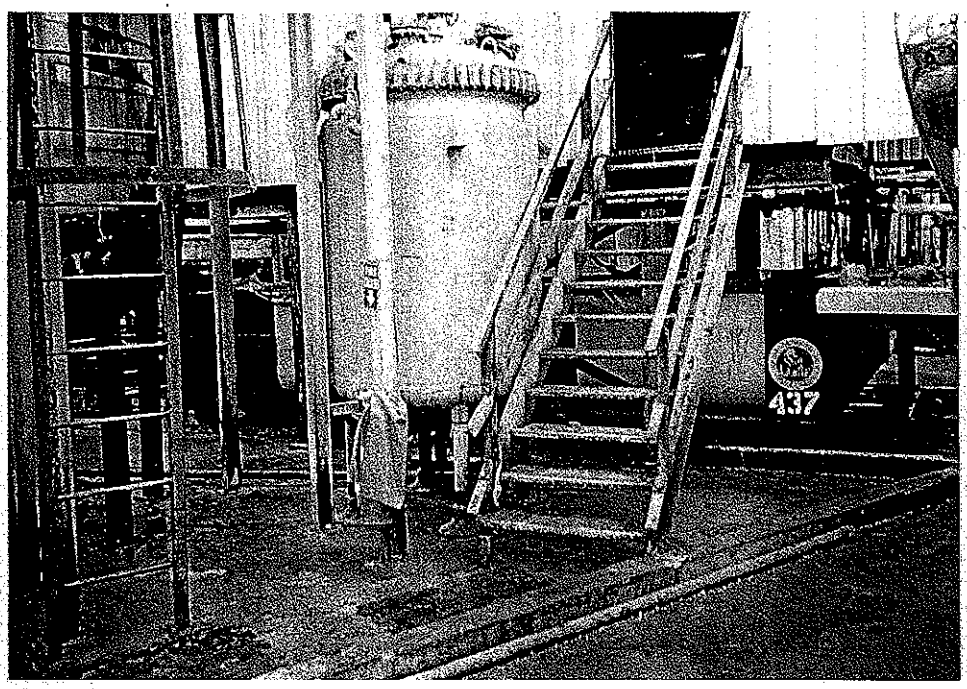
SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN LOCATION MAP



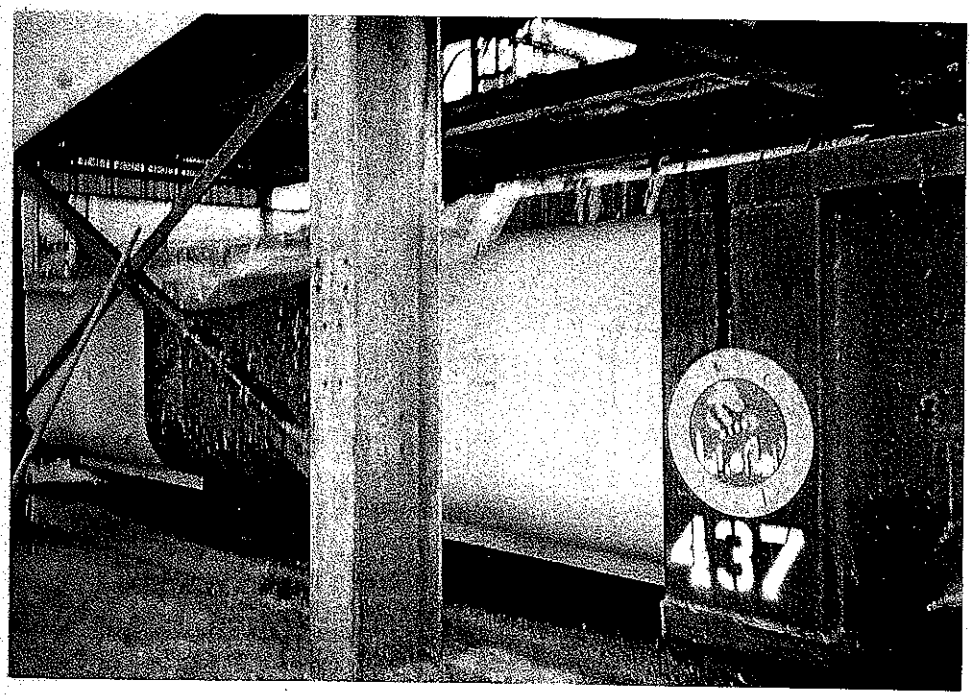
1. 01-30-92, 04:30 p.m. View to the west. State-owned drainage ditch, flowing west along the southern boundary of the facility as seen from the southeastern corner of the facility. Earthen berm and concrete dike can be seen between the rail cars and the ditch. Photograph taken by David Michelsen.



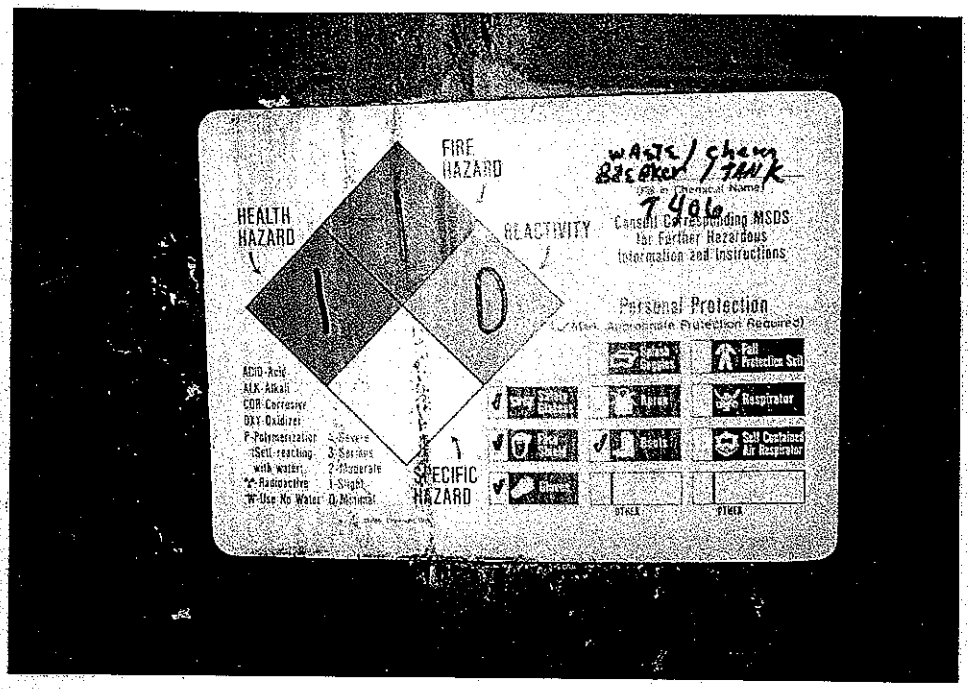
2. 01-30-92, 11:53 a.m. View to the east. Earthen berm on the southern perimeter of the facility. The berm surrounds the facility, varying in height from nonexistent in some places to four feet at the wastewater outfall in southwest corner of the facility. The natural gas wells in the foreground are owned and operated by ENSERCH and supply the only fuel used to fire KMCO's boiler. Photograph taken by David Michelsen.



3. 01-30-92, 11:13 a.m. View to the northwest. Bulk Storage Area for Diatomaceous Earth, roll-off bin 1 (SWMU No. 1, Reaction Area 2) (yellow, horizontal unit) that collects diatomaceous earth from an overlying filter press and absorbent wastes consisting of chemical absorbent pads or pellets used to absorb small spills. Photograph taken by David Michelsen.

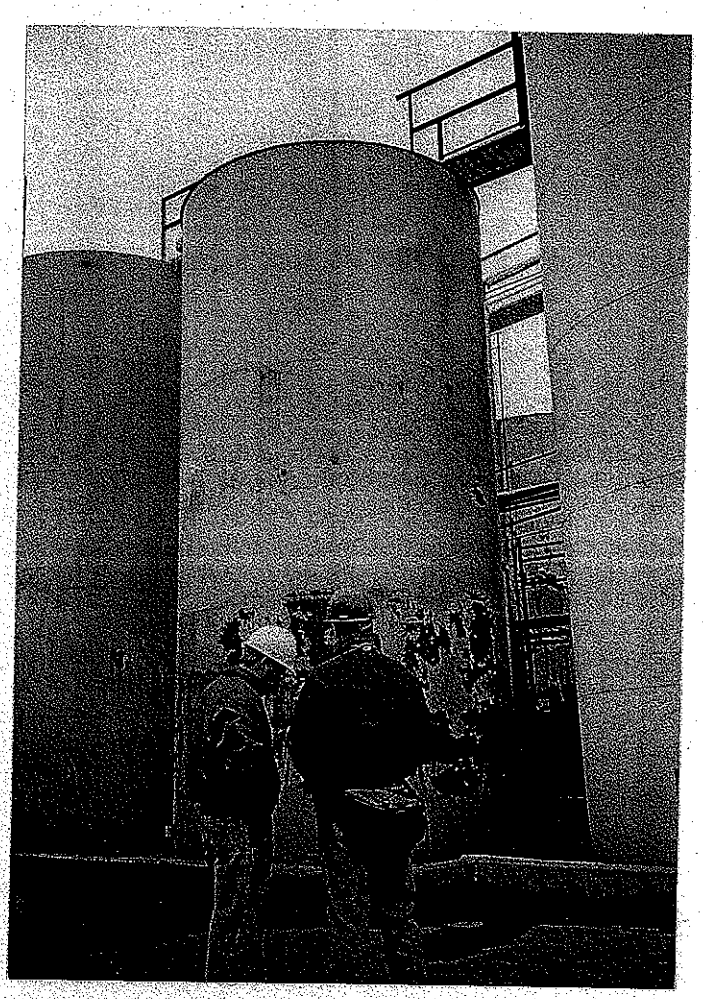


4. 01-30-92, 11:13 a.m. View to the northwest. Second view of Bulk Storage Area for Diatomaceous Earth, roll-off bin 1 (SWMU No. 1, Reaction Area 2). Photograph taken by David Michelsen.

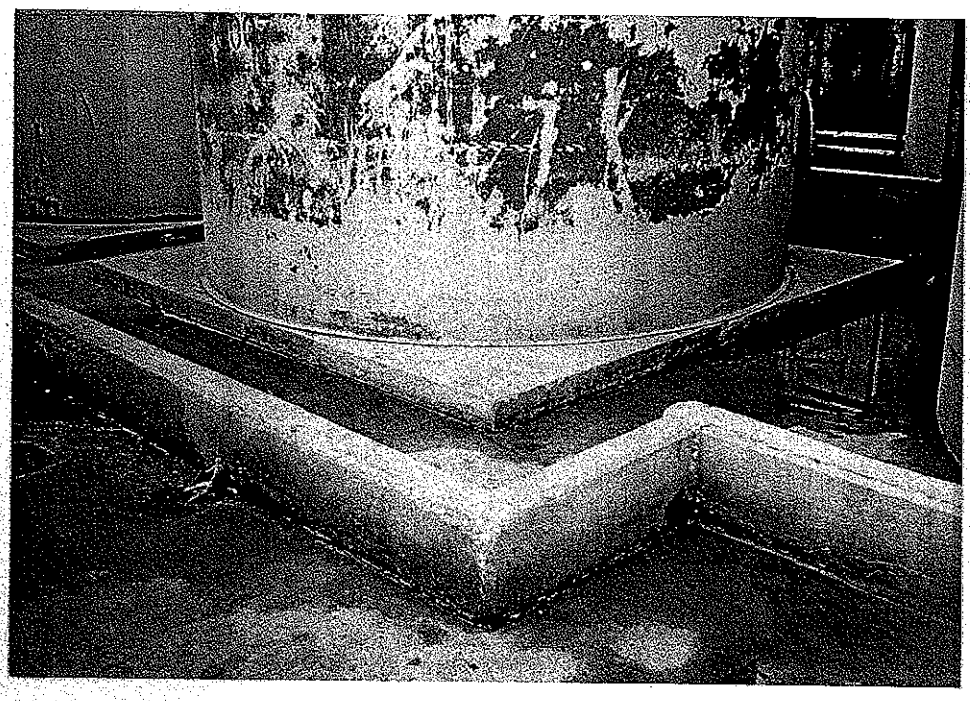


5. 01-30-92, 01:30 p.m. View to the west. Placard for Storage Tank T-406 (SWMU No. 4). The 8,000-gallon tank alternately stores wastewater or chemical breakers. Photograph taken by David Michelsen.

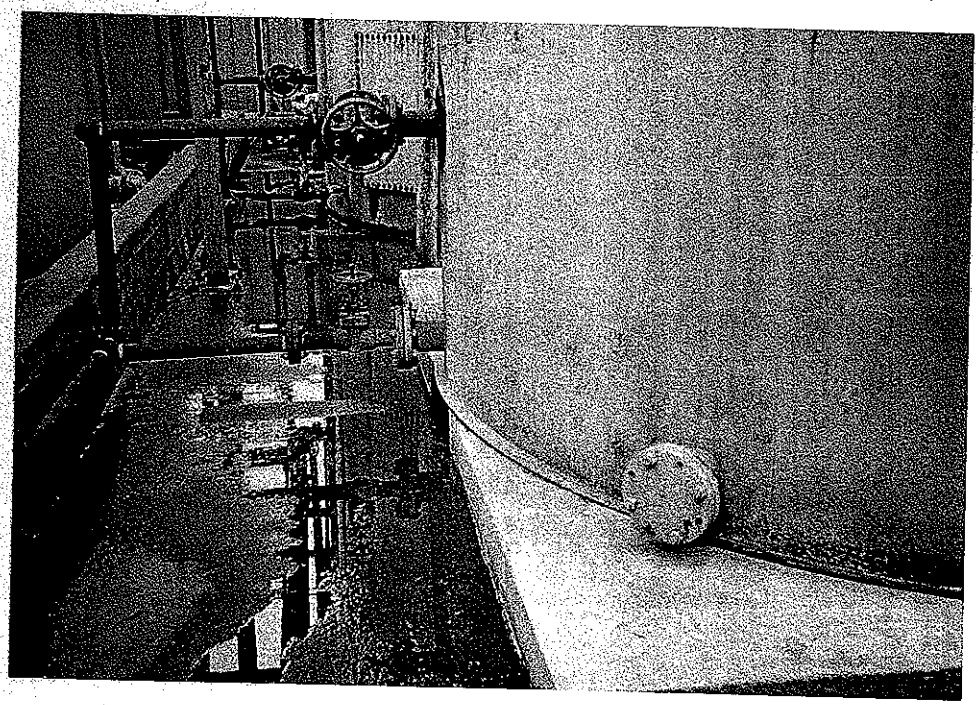
6. 01-30-92, 01:30 p.m. View to the west. A second view of Storage Tank T-406 (SWMU No. 4). The streaks on the sides of the tank were caused by the removal of insulation and not from spillage. Photograph taken by David Michelsen.



9. 01-30-92, 11:35 a.m. View to the south. A third view of Storage Tank T-007 (SWMU No. 8). Photograph taken by David Michelsen.

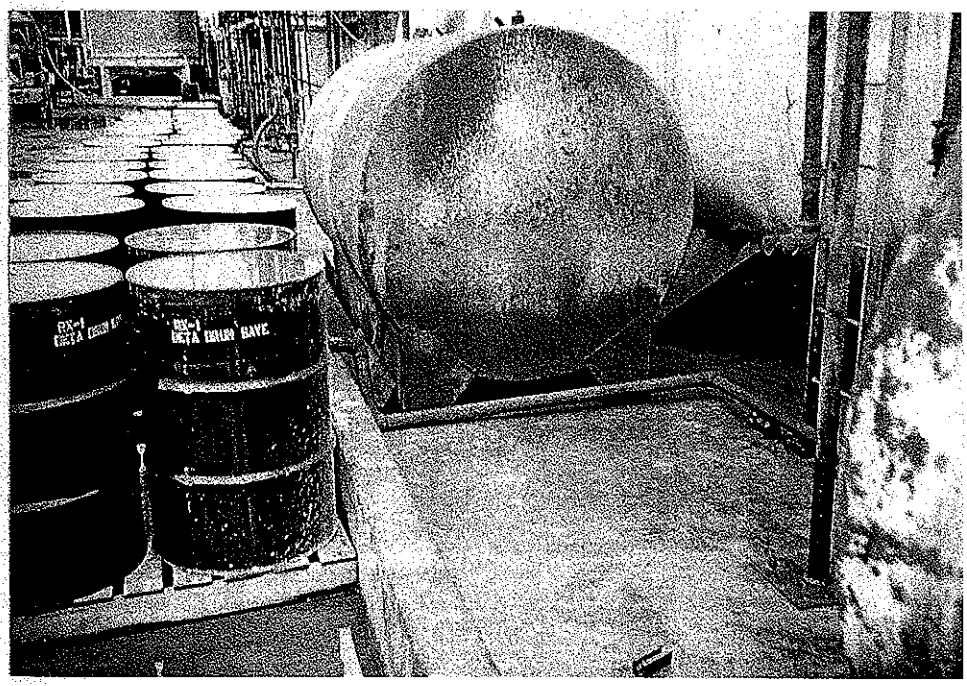


7. 01-30-92, 11:34 a.m. View to the southwest. Storage Tank T-007 (SWMU No. 8). Photograph taken by David Michelsen.

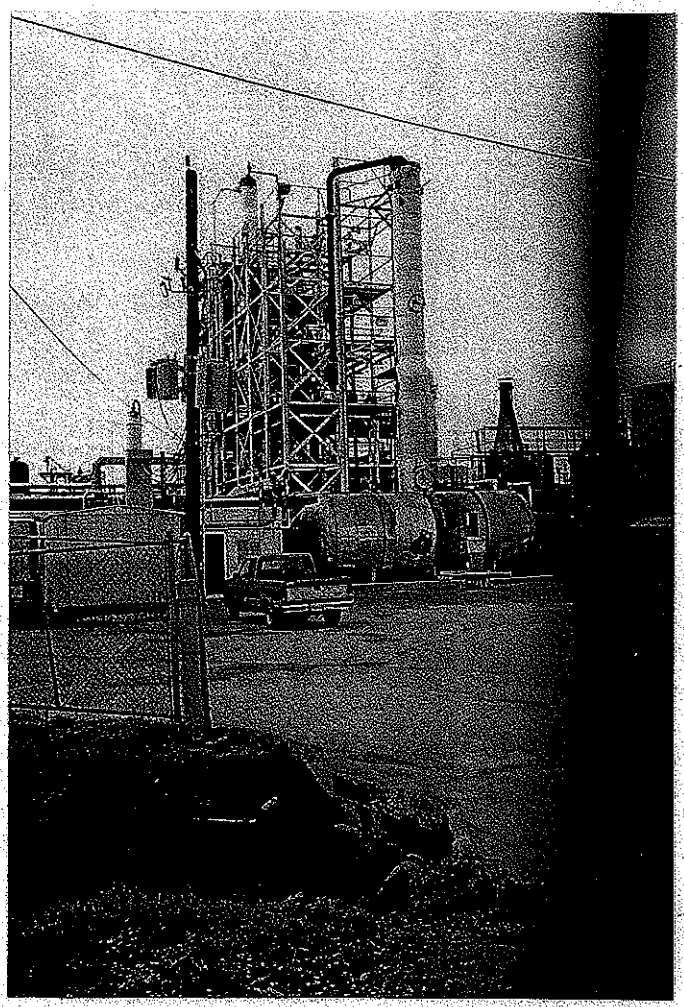


8. 01-30-92, 11:34 a.m. View to the north. Inlet/outlet for Storage Tank T-007 (SWMU No. 8). Photograph taken by David Michelsen.

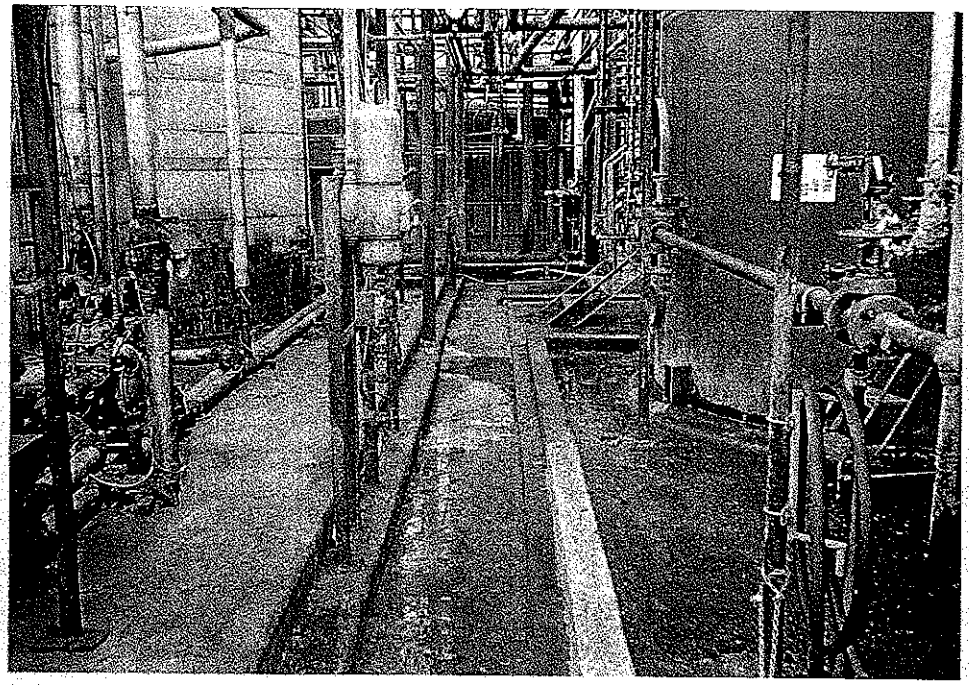
10. 01-30-92, 01:24 p.m. View to the north. Waste Oil Storage Tank (SWMU No. 13), KMCO's 500-gallon used oil storage tank. Photograph taken by David Michelsen.



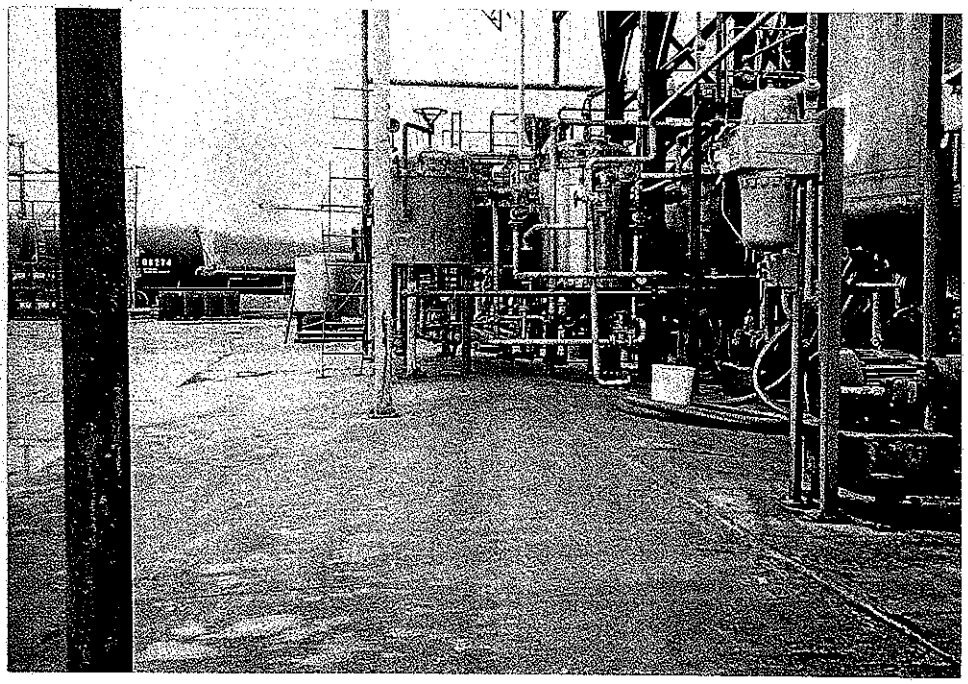
11. 01-30-92, 01:25 p.m. View to the north. Metal skid underlying Waste Oil Storage Tank (SWMU No. 13) and six-inch concrete dike surrounding both oil storage tanks. Photograph taken by David Michelsen.



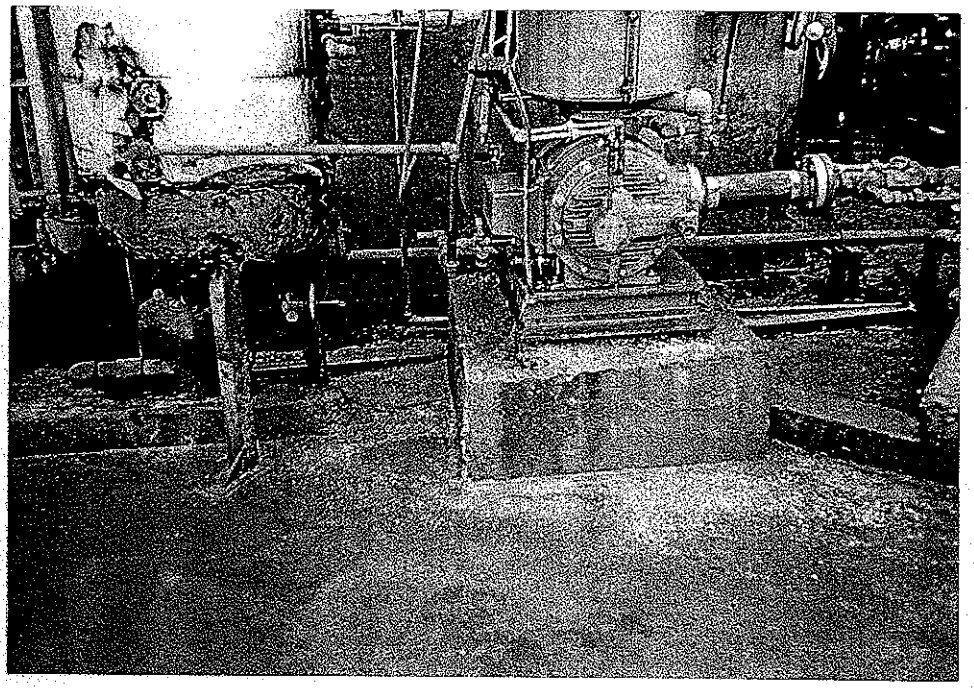
12. 01-30-92, 04:30 p.m. View to the northwest from the southeastern corner of the facility. Facility Wide Concrete Pad (SWMU No. 14.1), concrete dike and earthen berm, and state-owned drainage ditch. Photograph taken by David Michelsen.



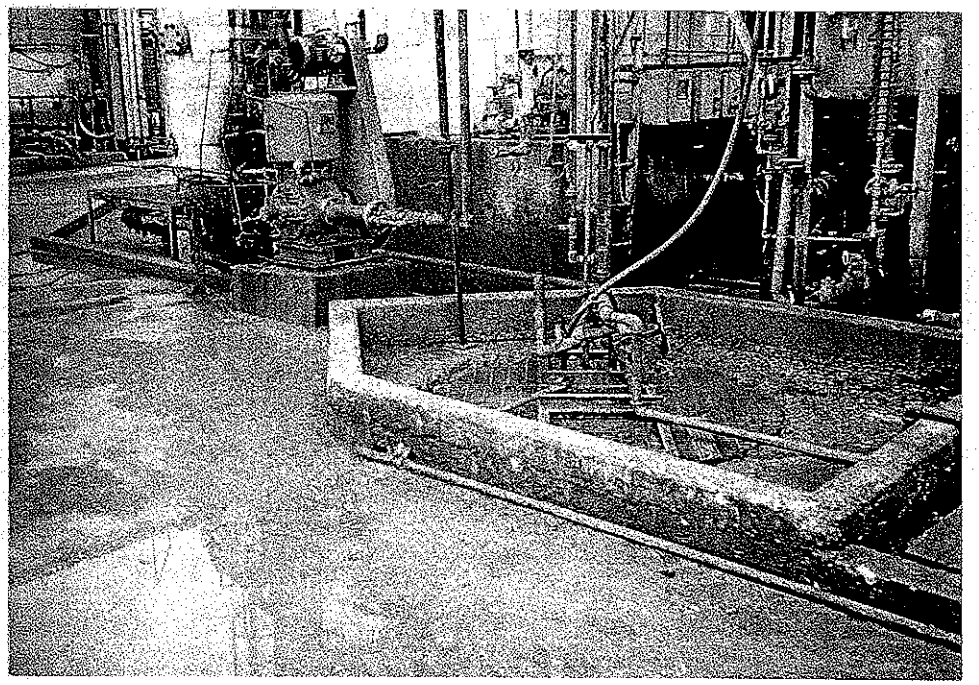
13. 01-30-92, 11:15 a.m. View to the west. Facility Wide Concrete Pad (SWMU 14.1) within a tank farm. Photograph taken by David Michelsen.



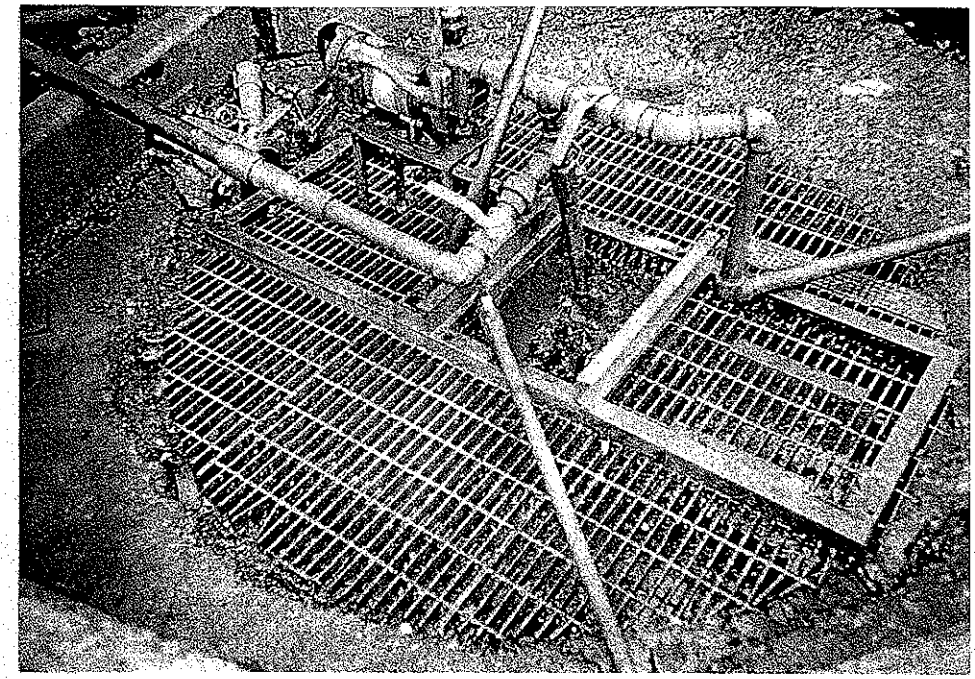
14. 01-30-92, 01:44 p.m. View to the west. Process area on the Facility Wide Concrete Pad (SWMU No. 14.1) that KMCO plans to encircle with a concrete dike. The concrete pad is cambered to encourage surface-water flow to a Stormwater and Spill Collection Sump (SWMU No. 14.2, not shown) in the interior of the process area. Photograph taken by David Michelsen.



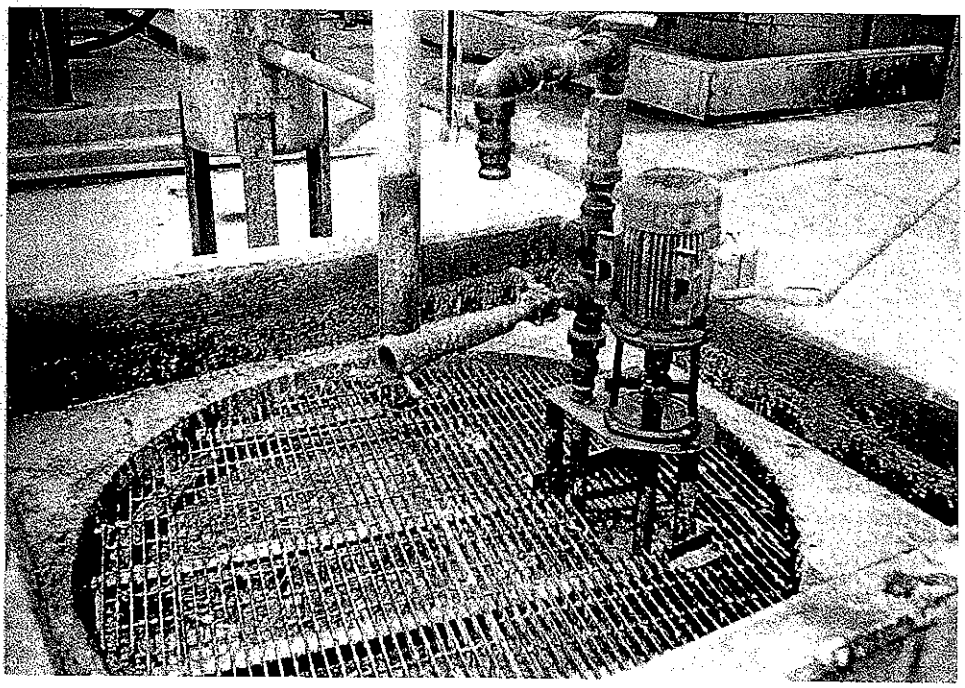
15. 01-30-92, 11:08 a.m. View to the south. Leaking pump discharging oil to the Facility Wide Concrete Pad (SWMU No. 14.1), an example of routine process spills that may contribute chemical constituents to stormwater. Photograph taken by David Michelsen.



16. 01-30-92, 11:04 a.m. View to the southeast. Stormwater and Spill Collection Sump (SWMU No. 14.2). The tank pad is surrounded by a six-inch concrete curb. The VSI team observed some gaps in the curb. Photograph taken by David Michelsen.

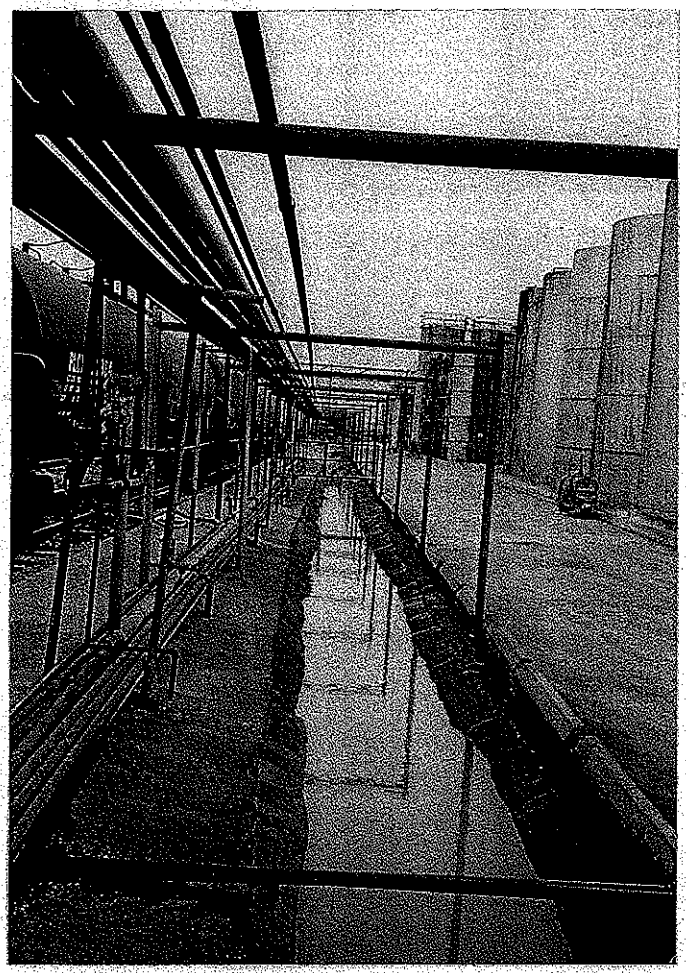


17. 01-30-92, 11:05 a.m. View to the south. Close-up of water with oily sheen in Stormwater and Spill Collection Sump (SWMU No. 14.2) shown in Photograph 16. Photograph taken by David Michelsen.

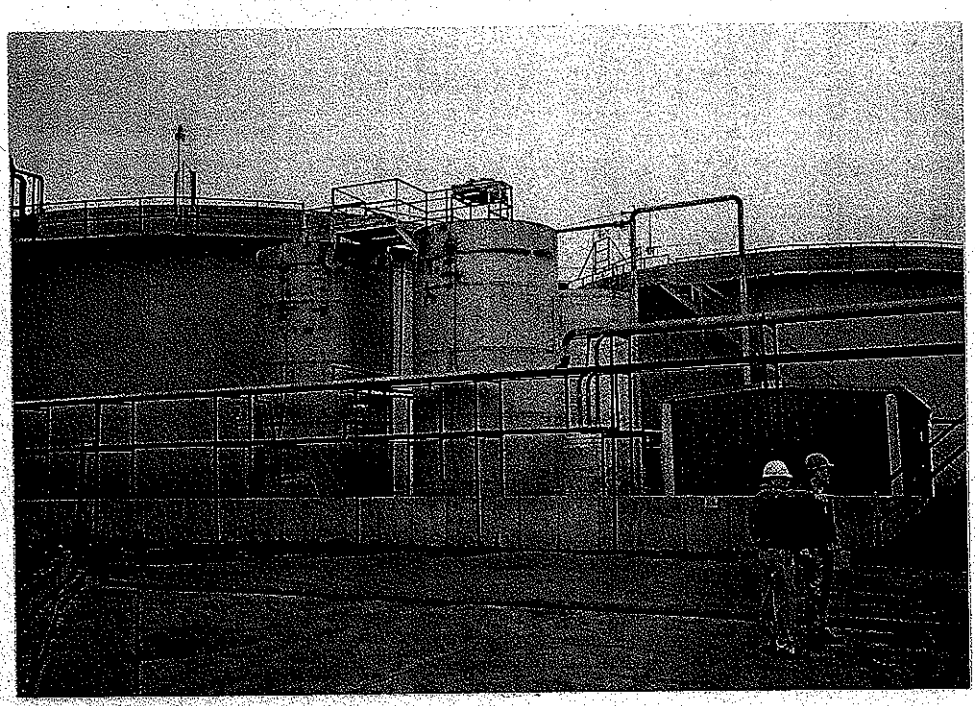


18. 01-30-92, 11:43 a.m. View to the north. A second Stormwater and Spill Collection Sump (SWMU No. 14.2) and pump that collects and conveys stormwater to KMCO's on-site Wastewater Treatment Plant. Photograph taken by David Michelsen.

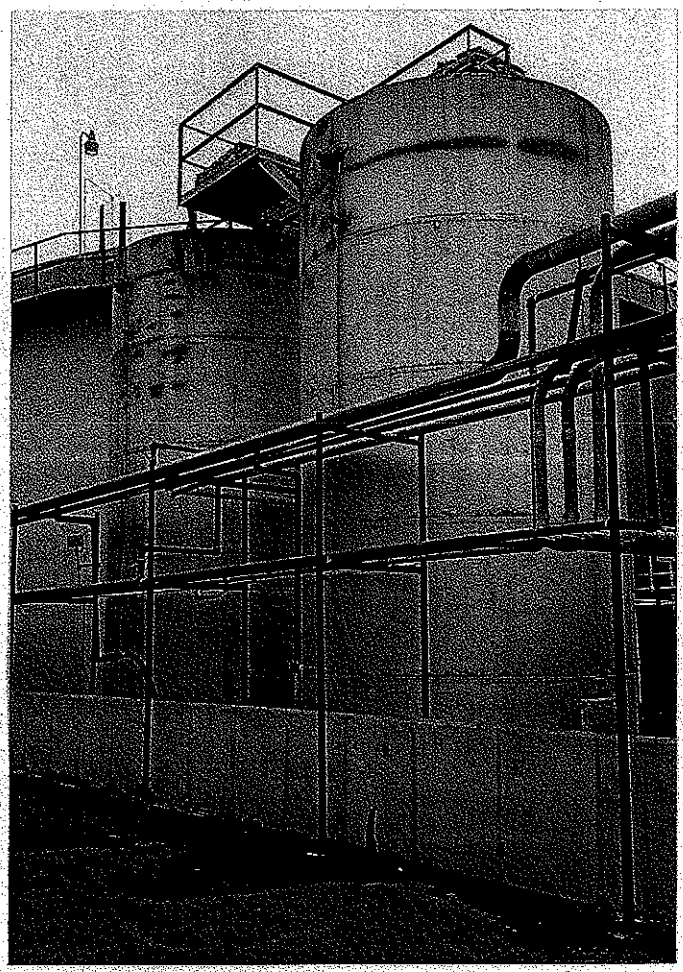
19. 01-30-92, 12:22 p.m. View to the south. A view of the Stormwater Collection Ditch (SWMU No. 14.3), showing a pump at the upper center of the photograph that conveys water to the treatment plant. The yellow unit to the right of the pump turns a "ringer" or belt that skims the water surface of the ditch, collecting organic matter and oil and pumping them to a waste storage tank. The belt does not run constantly but is instead turned on during heavier rainstorms. Photograph taken by David Michelsen.



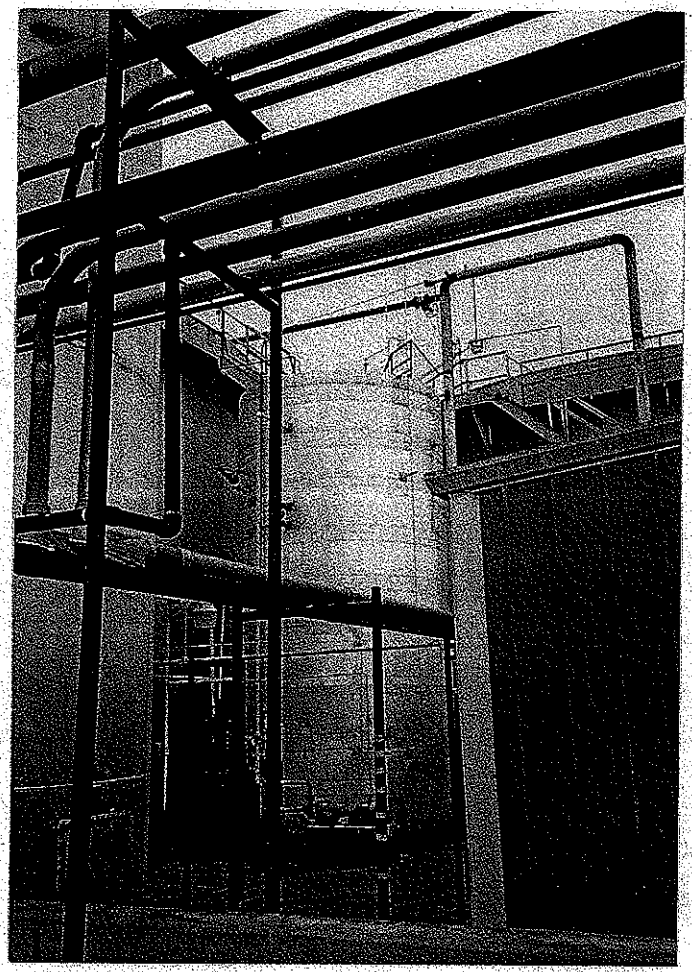
20. 01-30-92, 12:31 p.m. View to the north. A second view of the Stormwater Collection Ditch (SWMU No. 14.3). Photograph taken by David Michelsen.



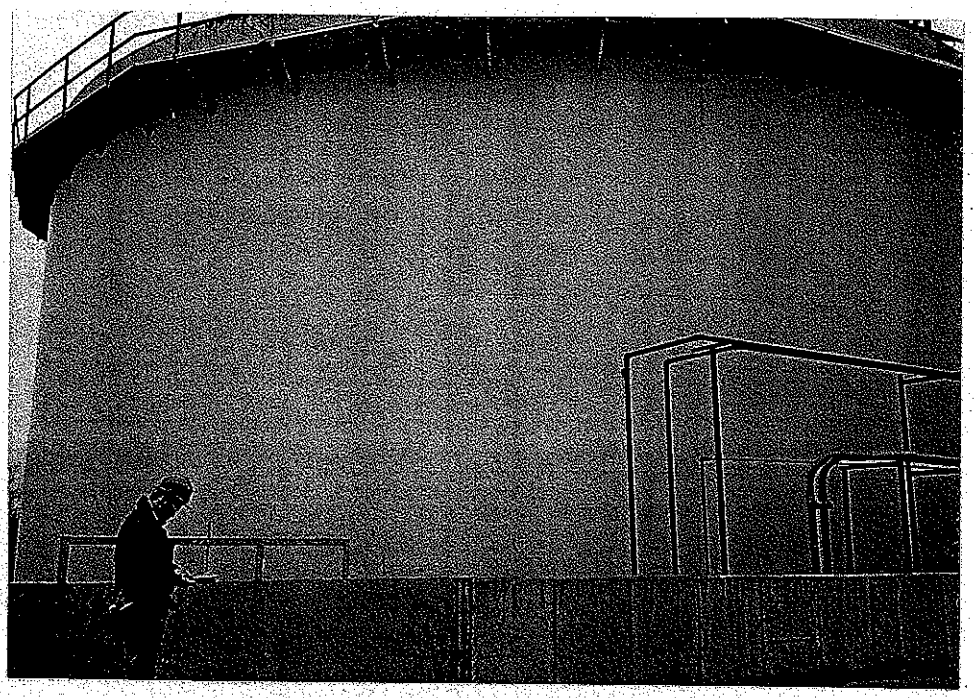
21. 01-30-92, 12:40 p.m. View to the northeast. KMCO's Wastewater Treatment Plant (SWMU No. 15). Photograph taken by David Michelsen.



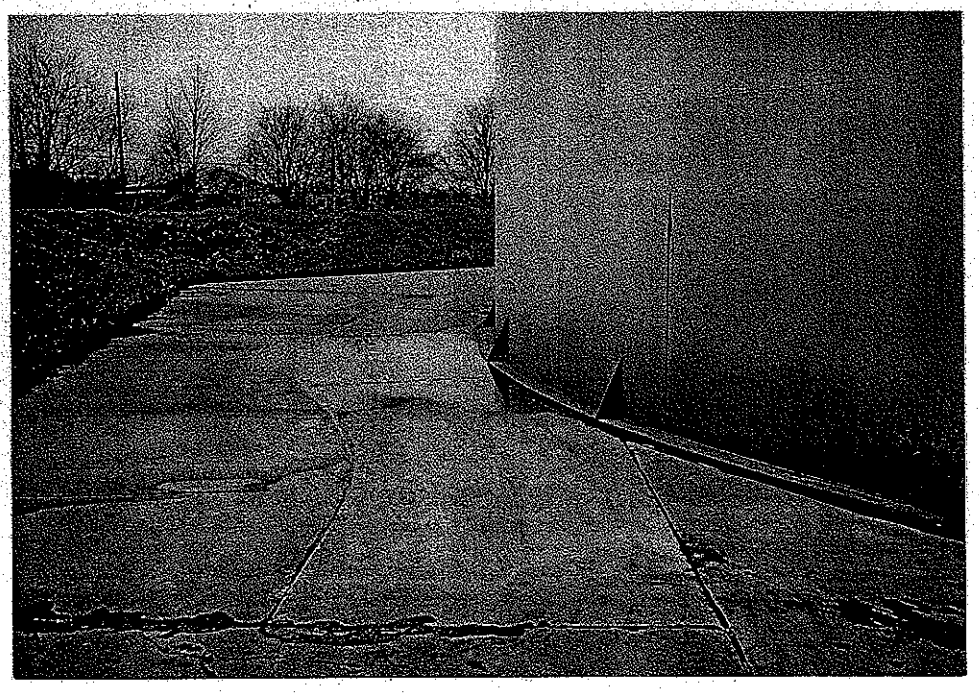
22. 01-30-92, 12:00 p.m. View to the southeast. Adjusting Tanks (SWMU No. 15.1) for KMCO's Wastewater Treatment Plant. Photograph taken by David Michelsen.



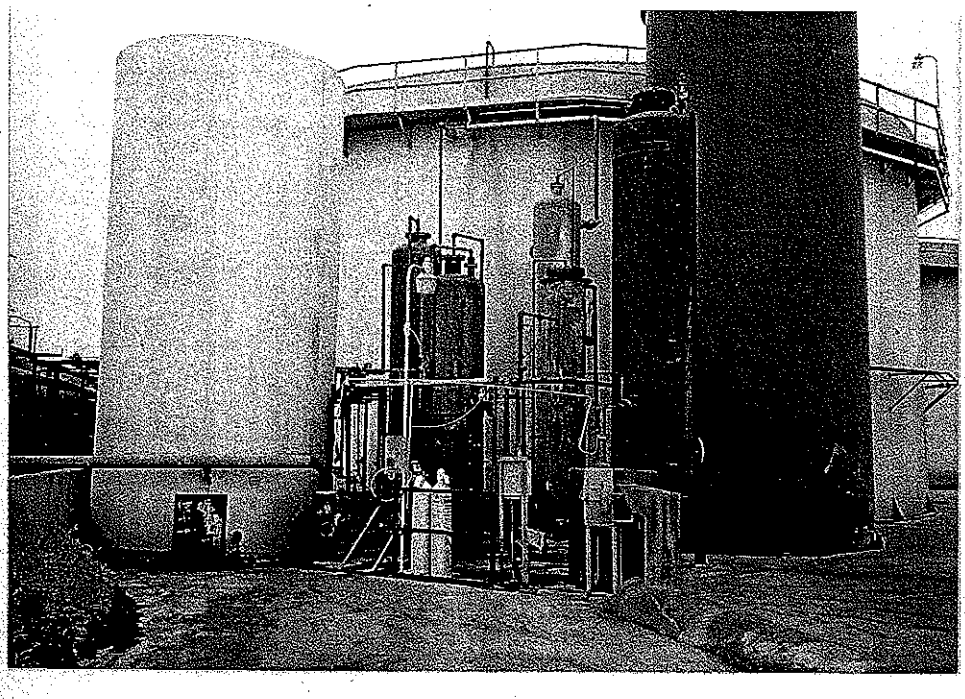
23. 01-30-92, 11:55 a.m. View to the southeast. Anaerobic Digester (SWMU No. 15.2) (upright, silver tank) in the background, which sits directly on the concrete pad. Photograph taken by David Michelsen.



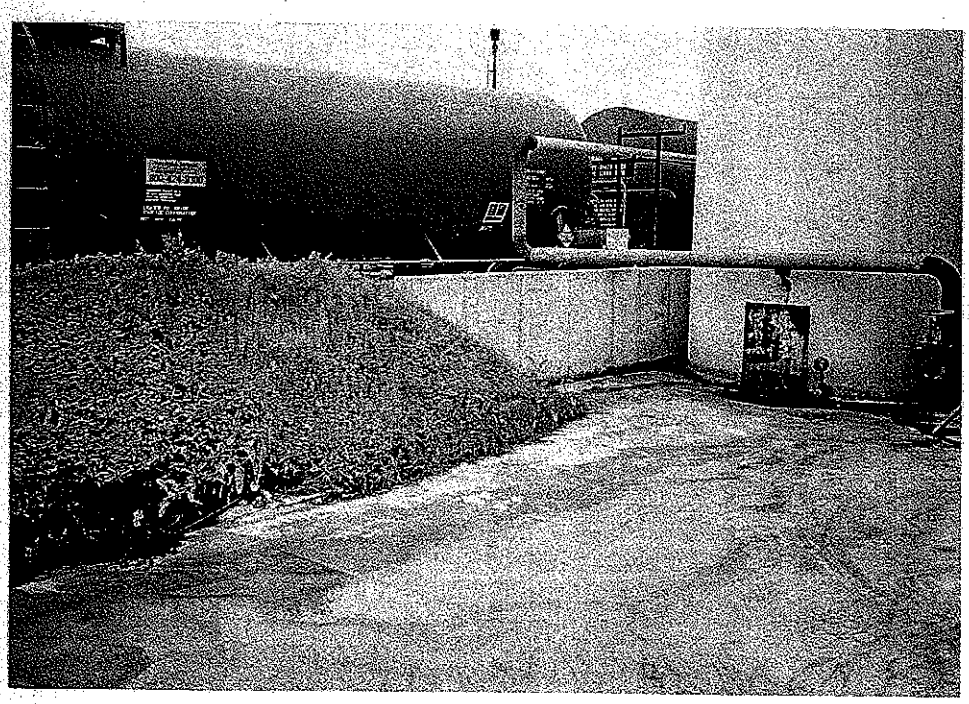
24. 01-30-92, 11:53 a.m. View to the southwest. Equalization Tank (SWMU No. 15.3) for KMCO's Wastewater Treatment Plant. Photograph taken by David Michelsen.



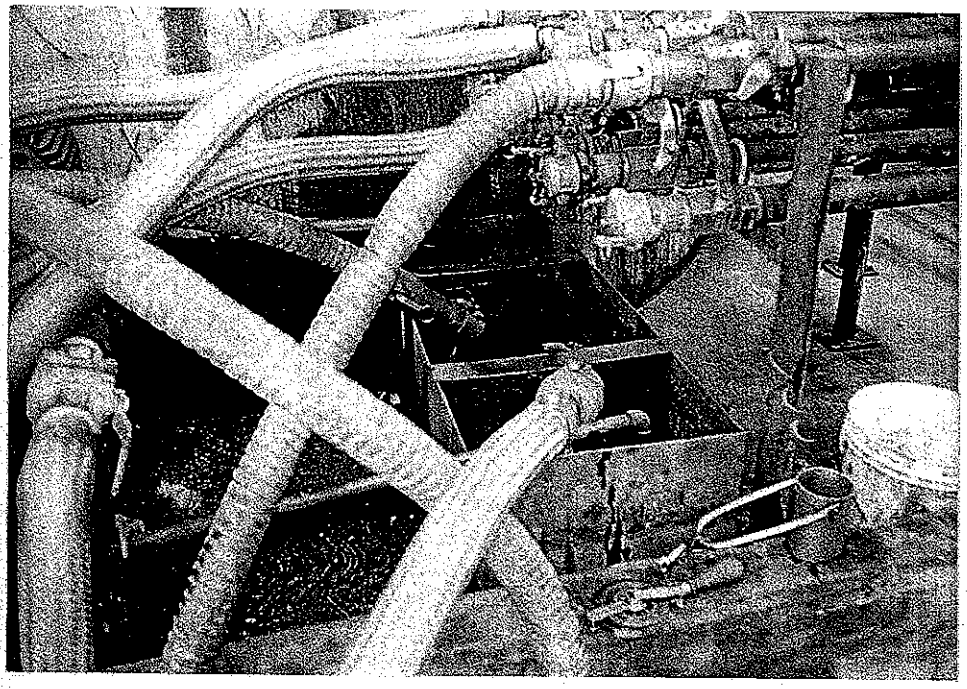
25. 01-30-92, 11:54 a.m. View to the southeast. Equalization Tank (SWMU No. 15.3), concrete pad, and earthen berm. Photograph taken by David Michelsen.



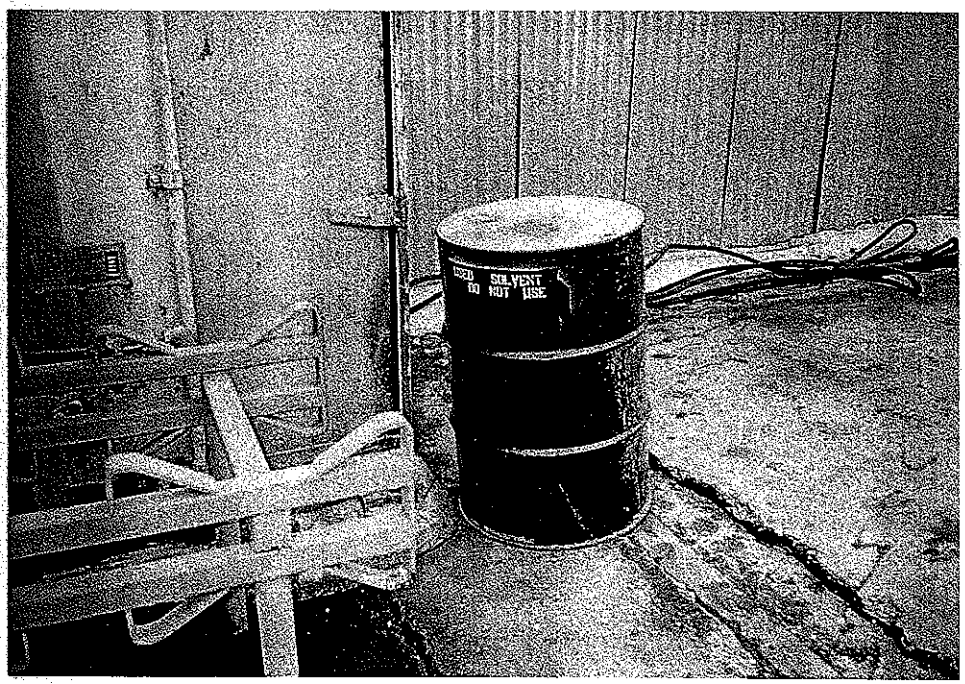
26. 01-30-92, 12:40 p.m. View to the northeast. KMCO's Wastewater Treatment Plant (SWMU No. 15), with the Aeration Tank (SWMU No. 15.4) shown in the background, the Clarifier (SWMU No. 15.5) in right foreground (large black tank), one Chlorine Contact Chamber (SWMU No. 15.8) (next to the Clarifier), one Sand Filter (SWMU 15.6), three Carbon Filters (SWMU No. 15.7),-and the Surge Tank (SWMU No. 15.9) at the left. KMCO's NPDES outfall is shown in the right foreground of the photograph. Photograph taken by David Michelsen.



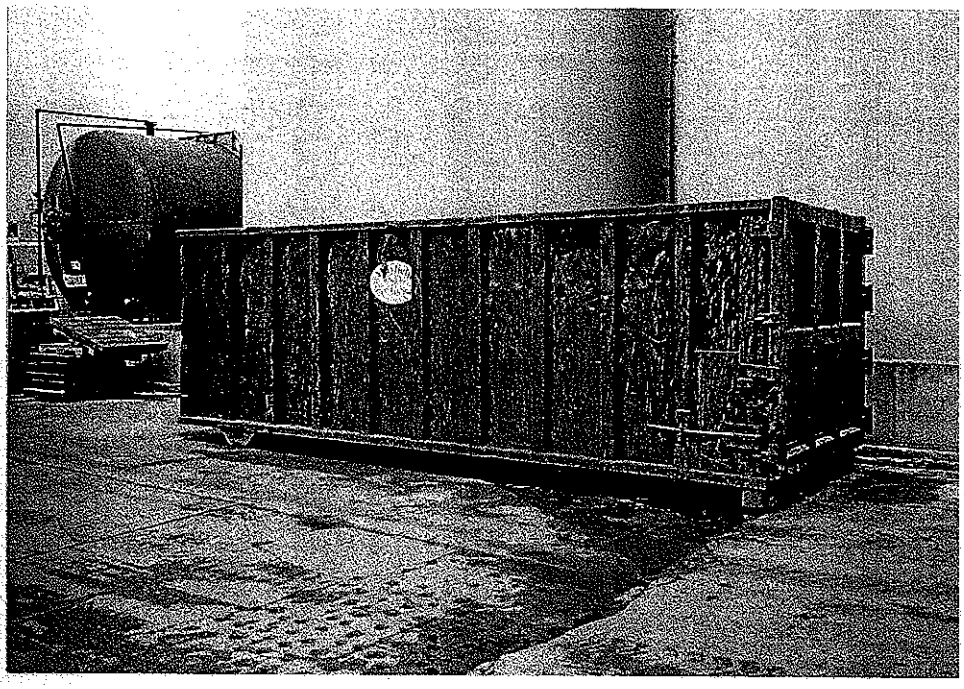
27. 01-30-92, 12:50 p.m. View to the northwest. A portion of the concrete dike and earthen berm that contain the Wastewater Treatment Plant at the southwestern corner of the facility. The inactive Surge Tank (SWMU No. 15.9) is in the right background. Photograph taken by David Michelsen.



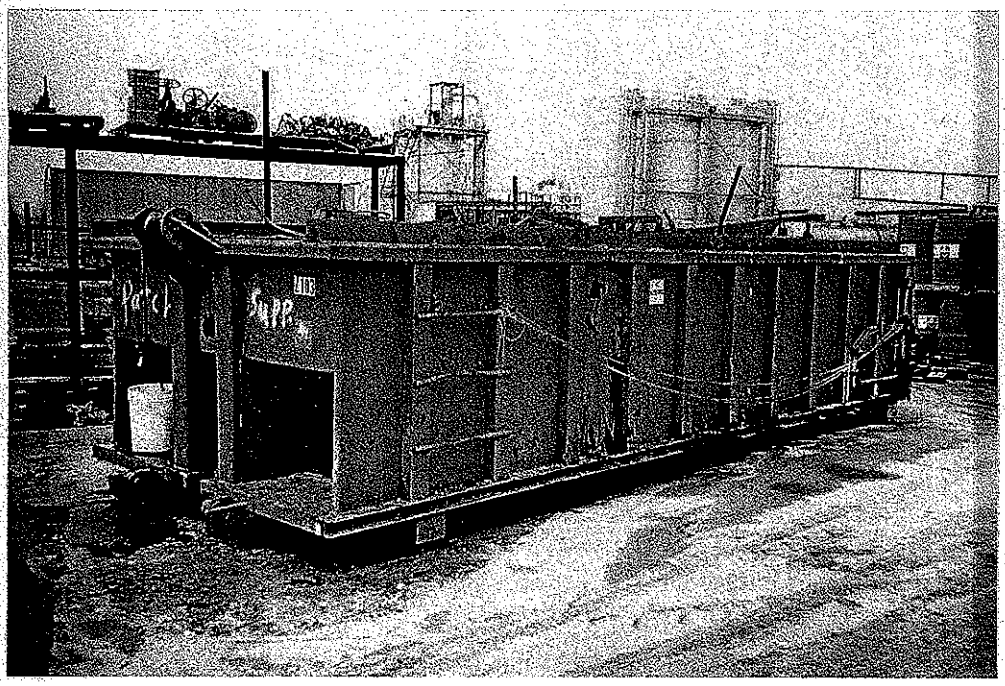
28. 01-30-92, 12:55 p.m. View to the northwest. A Drip Pan (SWMU No. 16) that collects drippage from manifolds. Photograph taken by David Michelsen.



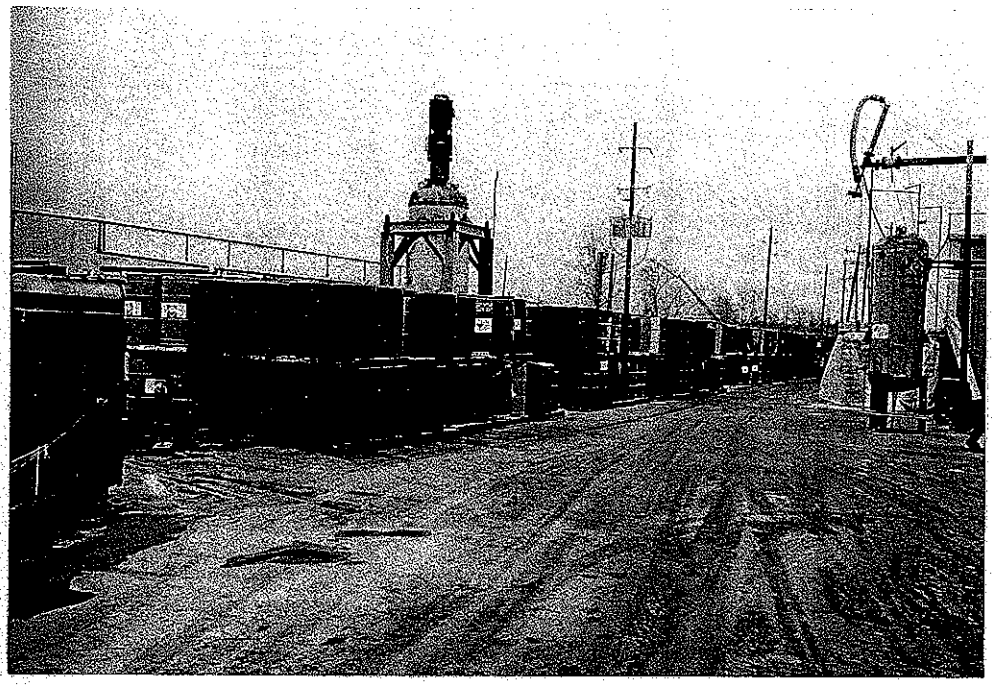
29. 01-30-92, 11:47 a.m. View to the south. Solvent Satellite Collection Drum (SWMU No. 17) outside the maintenance shop that is to be picked up by Safety-Kleen. Photograph taken by David Michelsen.



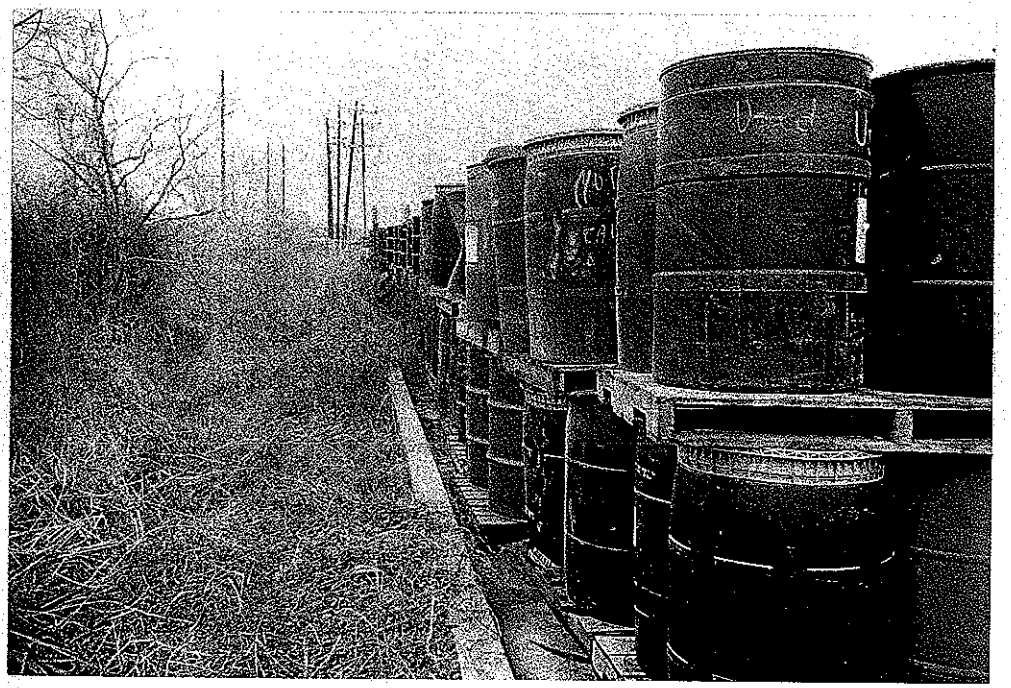
30. 01-30-92, 01:19 p.m. View to the south. Roll-Off Bin for Miscellaneous Solid Wastes (SWMU No. 18) in which miscellaneous solid wastes are stored before removal by Mayfield. Green substance at based of dumpster is coloring used for antifreeze. Photograph taken by David Michelsen.



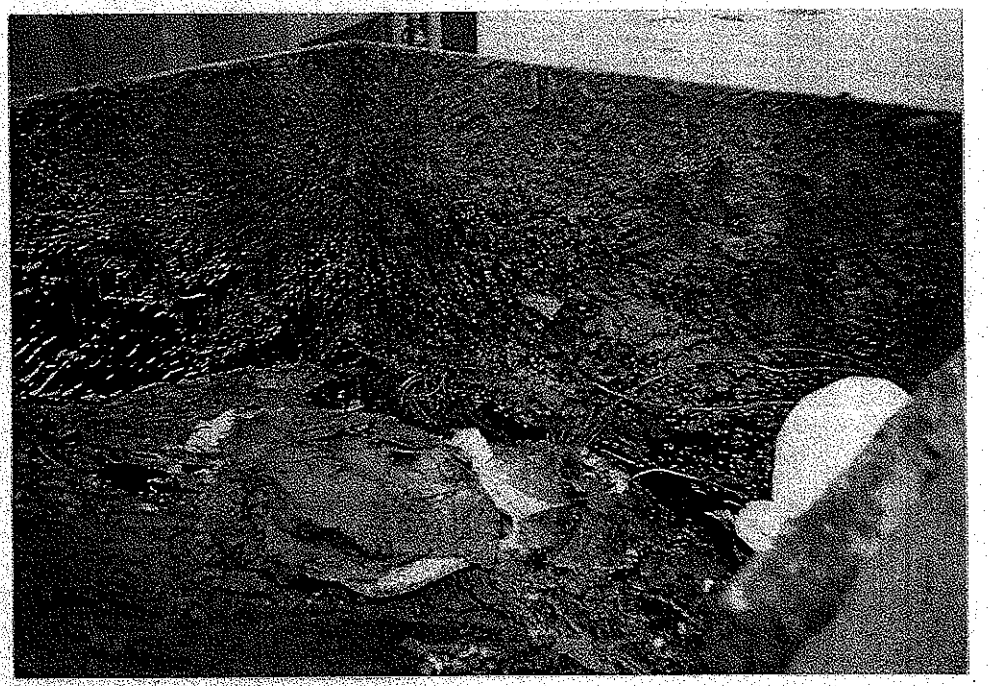
31. 01-30-92, 01:56 p.m. View to the north. Roll-Off Bin for Crushed Drums (SWMU No. 19) that stores crushed drums before monthly removal by Evans Cooperidge. Photograph taken by David Michelsen.



32. 01-30-92, 02:03 p.m. View to the northeast. Empty Drum Storage Area Along Northern Border of the Facility (AOC No. 1). Drums are removed each month by Evans Cooperidge. Photograph taken by David Michelsen.



33. 01-30-92, 02:03 p.m. View to the east. A second view of the Empty Drum Storage Area Along Northern Border of the Facility (AOC No. 1) shown in Photograph 32. The drainage ditch (six feet wide, four feet deep) to the left in the photograph flows to the west (towards the viewer). Secondary containment is provided by a six-inch concrete curb. Photograph taken by David Michelsen.



34. 01-30-92, 01:56 p.m. View to the north. Green Hopper for Managing Diatomaceous Earth (AOC No. 2) at the northern edge of the facility that stores filter cake (diatomaceous earth) before it is removed by Chemical Waste Management of Sulphur, Louisiana. Photograph taken by David Michelsen